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1. The Edinburgh Medical Journal. Oliver and Boyd.
2. The Retrospect of Medicine. Edited by James Braithwaite. Simpkin, Marshall, and Co.
3. Pharmaceutical Journal.
4. The Lancet.
5. The British Medical Journal.
6. The Journal of Mental Science. London: Churchill.
7. The Glasgow Medical Journal. A. MacDougall.
8. The Medical Press and Circular.
9. Transactions of the Medical and Chirurgical Society. London: Longmans.
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12. The Journal of Anatomy and Physiology. Macmillan.
13. Brain. London: Macmillan & Co.
14. The Bristol Medico-Chirurgical Journal.
15. The Provincial Medical Journal.
16. The British Journal of Dermatology.
17. The Asclepiad.
18. The Medical Chronicle.
19. The Birmingham Medical Review.
20. The Liverpool Medical Journal.

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21. The Montreal Medical and Surgical Journal. Richard White. Box 386, P.O., Montreal.

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22. The American Journal of the Medical Sciences. Philadelphia: Henry C. Lea. London: Trübner and Co.
23. The Medical Record. New York: William Wood & Co.
24. Medical News. Philadelphia: Henry C. Lea, Son and Co.
25. The American Journal of Insanity, Utica, N. Y. State Lunatic Asylum.
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27. The New York Medical Journal. New York and London: D. Appleton & Co.
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29. Journal of Cutaneous and Venereal Diseases. New York: D. Appleton & Co.

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32. The St. Louis Medical and Surgical Journal. St. Louis: Frank M. Rumbold and Co.
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34. Index Medicus. George S. Davis. Detroit, Michigan.
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44. Revue de Thérapeutique Médico-Chirurgicale. Paris: Masson.
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51. Gazette Hebdomadaire. Paris: 91, Rue de Lille.
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2. Manual of Practical Anatomy. By D. J. Cunningham, M.D. Edin. et Dubl., D.Sc., LL.D., D.C.L. Oxon, F.R.S. Vol. I. Edinburgh and London: Young J. Pentland. 1893. 8vo. Pp. 669.

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22. A Temporary Change in the Axis of Astigmatism. By George M. Gould, A.M., M.D., of Philadelphia. Reprint. 1893. Page 1.

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32. A New Instrument for Controlling Tonsillar Hæmorrhage. By H. Hoyle Butts, M.D. New York: Trow Directory. Reprint. 1893. Pp. 8.

33. Tuberculous Pleurisy. By William Oster, M.D. Boston: David Klapp & Son. 1893. Reprint. Pp. 66.

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42. Address on Hygiene. Delivered by Prof. Samuel G. Dixon, M.D., at the Meeting of the State Medical Society, Williamsport, Pa. Pp. 16.

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49. The Canadian Practitioner. Vol. 18. No. 9. September, 1893.

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THE DUBLIN JOURNAL

OF

MEDICAL SCIENCE.

NOVEMBER 1, 1893.

PART I.

ORIGINAL COMMUNICATIONS.

ART. XI.—*Dur-hæmatoma associated with Jacksonian Epilepsy.*[a] By JOHN EUSTACE, jun., M.B., B.Ch. (Univ. Dub.), M.P.C.; Assistant Medical Superintendent, Hampstead and Highfield Private Asylums; late Clinical Assistant, Royal Asylum, Morningside, Edinburgh; and ALFRED R. PARSONS, M.B., B.Ch. (Univ. Dub.), M.R.C.P.I.; Assistant Physician to Sir Patrick Dun's Hospital.

Clinical History.—Mr. X. was admitted to Hampstead in September, 1888. He was twenty-eight years of age, unmarried, and a farmer by occupation. With the exception of an uncle, who died of syphilitic general paralysis of the insane, there is no family history of insanity in either direct or collateral branches. Father and mother are both living; the former suffers from paralysis agitans. One sister has occasional attacks of hysteria.

It is certain that the patient was not addicted to alcohol or sexual excess, nor had he contracted syphilis. There was a vague history of a blow on the head when a child, but at the time it was not considered necessary to call in a doctor, and neither during life nor after death could we discover a scar.

For about a year prior to admission Mr. X. appears to have suffered from *petit mal*, and was treated with bromide by the family physician. His friends did not consider him insane until the week before admission, when he commenced to plan and build a house on a magnificent scale.

[a] Read before the Section of Pathology of the Royal Academy of Medicine in Ireland, Friday, March 24, 1893.

Sandringham was taken as a model, and artificial lakes, acres of gardens, huge glass-houses, and expensive plantations figured in the design. He was engaged to be married, and when remonstrated with explained that he thought nothing too good for his wife.

The immediate cause of his being sent to Hampstead was that he made an attempt to stab his sister with a pruning knife. Drs. Dobbs and Evans signed the certificates, and I am indebted to them for the previous history of the case.

On admission his condition was diagnosticated as simple mania. He was intensely happy, very garrulous, pleased with his surroundings, and did not appear to find the restraint of asylum-life irksome. He was vain of his personal appearance, and boastful to absurdity of his strength and of his hunting exploits. However, he was sufficiently sane to be permitted to roam about the grounds and farm by himself, and to ride and drive accompanied by an attendant. The physical examination proved that he was in excellent bodily health, and that all his viscera were normal.

During October he had three attacks of *petit mal*, and the riding was discontinued.

In November he had his first true convulsive seizure. It occurred when he was playing billiards, and he had no premonitory symptoms, but, turning pale, suddenly fell on the floor, and had a general convulsion. It was observed by the attendants that the *left* arm and leg worked more violently then the right. He was at once put to bed, and when seen was in the comatose stage. Temperature, 101°; pulse, 98, very full and bounding. The *left* side, and particularly the arm and leg, were bloodless, cold, and paralysed.

Dr. Arthur Wynne Foot saw him several times in consultation with my father, and the probability of the existence of a tumour affecting the right hemisphere of the brain was discussed, but the signs were not deemed sufficient to warrant operative interference. Dr. Swanzy examined his eyes, but could detect nothing abnormal.

Similar attacks to the one I have described occurred during the next two years, on an average once a fortnight, but sometimes two or three fits would occur in the same week. Brown-Séquard's bromide mixture, though pushed till acne appeared, did not give relief, but the patient himself had great faith in antipyrin tabloids (gr. v.), and as the case progressed and subjective premonitory symptoms set in, such as headache, a feeling of anxiety, formication in the left hand, &c., in addition to obvious flushing and tremors, he believed that he frequently warded off an attack by swallowing a tabloid, or by tying a string round his left wrist. He also believed that sitting near a fire or in a very warm room induced an attack, and as a matter of fact under those circumstances he frequently had a fit. Several points are noteworthy in connection with the seizure:—

(1.) The premonitory stage lasted five or ten minutes, and sometimes

was not followed by an attack. (2.) The left thumb commenced as a rule to twitch first. (3.) The convulsive stage varied greatly in severity and duration, lasting from two to fifteen, or even thirty minutes. (4.) The pulse during this stage was hard and small, but as soon as he passed into the comatose stage it became very full, rapid, and bounding, increasing from 60 or 70 to 100 or 110, and the frontal arteries stood out like thick cords. (5.) There was conjugate deviation of the eyes to the left. (6.) The post-paroxysmal stage generally lasted from one-half to two hours, or even longer.

In September, 1890, as he was facile, weak-minded, had no delusions, and had not had a fit for nearly a month, he was sent home on trial, but the excitement consequent on the change appears to have greatly accelerated the process of degeneration, for in a week he was reported by his friends as having passed from being "very strange" to be so dangerously violent as to necessitate his return to the Asylum. A few days later Dr. Wilson (Assistant Physician) noted—"Very stupid, cannot articulate clearly, although he tries to talk incessantly. Is restless, and so unsteady in his gait that he cannot walk without support." He was given a tonic and fattening diet, and improved during the next month, but on November 13th, 1890 (*i.e.*, about two years after admission), he had a slight general convulsive seizure. This attack stands out as a landmark in the history of the case, for after it the *right* side, and not the left as formerly, was paralysed for about half an hour. The next day at 11 a.m. he had premonitory symptoms of an attack and stayed in the house, but it did not develop until 4 p.m., when he became aphasic, and without any obvious seizure the *right* side again become partially paralysed. At 1 a.m. he vomited a quantity of mucus and appeared to be sinking; his pulse rose to 128; temperature, 100°; respirations, 48. His lips and teeth were dry and covered with sordes, his eyes glazed and half open. He remained in this state till late the next evening, when he had a slight seizure. From this condition he gradually rallied, but during the next six months became more and more demented, although he had no attack till May, 1891, when he had seven fits within an hour, and both sides appeared to be equally affected. During the following month he developed symptoms of acute mania, and about the end of June control of the bladder and rectum was lost.

In August the case came directly under my care, and taking into consideration the slurring speech, the paresis, the epileptiform seizures, a lingual tremor (which, however, was not constant), and his state of joyous mania, in addition to spastic myosis, exaggerated reflexes, incontinence of urine and fæces, and recollecting his previous history, I pronounced him an anomalous case of general paralysis of the insane of the epileptiform, non-delusional variety—a diagnosis that was not verified by the *post-mortem* appearances.

He now increased in weight from 10 stone to 11 stone 2 pounds in four months, but from this date degenerated very fast. The convulsions, which were few, were localised to the right side, and lasted from a few minutes to one or two hours. Trismus now became a troublesome symptom in the first paroxysmal stage, lasting from twelve to twenty-four hours, and necessitating feeding by the nasal tube. A large dose of chloral and bromide, however, almost invariably curtailed the attack. It was given with his food, and at the same time a hypodermic injection of sulphate of atropin was administered. He now became so completely paralysed that from May till July 30th, 1892, when he died, he was confined to bed. He rapidly developed bed-sores, and finally pneumonia terminated his life.

During the last three months he had twice passed into the *status epilepticus*, and in order to carry out the chloral treatment it was necessary to chloroform him. Though in this state the convulsion was general, the right side was up to the last distinctly more affected than the left.

The *post-mortem* examination was made on the 1st of August, 1892. The skull-cap presented no abnormal appearance, and was removed without any unusual difficulty from the underlying dura mater. The external surface of the latter was likewise normal, but on reflecting it on the left side an extensive membrane (Fig. 2), covering over the whole of the hemisphere with the exception of its basal surface, was disclosed. This membrane was slightly adherent to the inner aspect of the dura mater, but had no organic attachment whatever to the arachnoid. It was of a bright red colour, and was practically of uniform thickness—about three-sixteenths of an inch—throughout its entire extent. On similarly reflecting the dura mater covering the right cerebral hemisphere, a structure became apparent which in some points resembled that found on the opposite side, though it differed considerably in its thickness and intimacy of attachment to the dura mater. Over the anterior part of the frontal and the occipital lobe the membrane was very thin, being little more than a delicate vascular veil, which could be readily peeled off the dura mater; while over the posterior portion of the frontal and the parietal lobe, it formed a large semi-fluctuating tumour (Fig. 1), measuring about an inch in its maximum thickness, and more firmly adherent to the dura mater. The brain tissue lying directly underneath this new formation was flattened and softened from its pressure. The pia-arachnoid was not morbidly adherent to the cortex, it was not waterlogged, and there were no granulations in the ependyma of the ventricles. Except the softening and flattening above mentioned, the brain presented no lesions visible to the naked eye. The weight of the brain meninges and tumour was forty-nine ounces, while the tumour, with the dura mater of its own side, weighed seven ounces. About five ounces of sanguineous fluid were drawn off from the sub-dural space.

A small portion of the membrane on the left side showed under the microscope numerous fibres intertwining with one another, blood-corpuscles in different stages of degeneration, and masses of pigment. When a section was made into the tumour its external wall was found to be firm, about one quarter of an inch in thickness, and composed of several laminæ of strong fibrous tissue, from the most external of which the dura mater could be detached without using much force. The inner wall of the tumour, on the contrary, was exceedingly thin, and when partially reflected showed a cyst filled with a large quantity of coagulated blood. As the clot had not undergone so-called organisation, and as no crystals of hæmatoidin could be detected in it, the probability is considerable that the hæmorrhage took place shortly before the patient's death. The dense fibrous tissue constituting the external wall of the cyst was probably of some years standing.

Several terms have been applied by different authors to the pathological conditions present in this case. Of these it may suffice to enumerate the following:—Pachymeningitis hæmorrhagica interna, hæmatoma of the dura mater, arachnoid cysts. Such formations, though stated to occur in profound alterations of the blood, in the acute infectious diseases—particularly in typhoid fever, scarlatina, small-pox, and relapsing fever—or as the result of injury, are exceedingly rare outside lunatic asylums. Gowers[a] states that for forty years not a single specimen of this condition was exhibited before the London Pathological Society, which receives the curiosities of metropolitan necroscopy. In asylums these lesions are by no means so uncommon. Of 637 unselected *post-mortem* examinations on the insane at Rainhill Asylum, Wigglesworth[b] states that 54 presented varying degrees of this affection. The age of the youngest patient was thirty, and the average age of the series of 54 cases was 51·61 years. The maximum number of cases in any one decade was 18, and these occurred in the decade from fifty to sixty.

Of the different forms of mental disorders associated with pathological features similar to those under consideration at present, general paralysis stands out prominently. Over half (29) of Wigglesworth's series were general paralytics. A similar proportion has been obtained by Bevan Lewis[c] from statistics based on 132 cases. He found that of these 63, or 47·7 per cent., suffered from general paralysis. In addition to the factors above

[a] Gowers. Diseases of the Nervous System. Vol. II. P. 294.
[b] Dictionary of Psychological Medicine. P. 879.
[c] Text-Book of Mental Diseases. P. 440.

enumerated in the production of this morbid condition, chronic alcoholism is mentioned by several authors.

The process is in almost half the cases bilateral, but often more marked on one side than the other. The membranes lie most frequently on the vertical and lateral aspects of the hemispheres, but may extend on to the base. They are, however, rarely, if ever, found on the lower aspect of the tentorium, or in the cerebellar fossa.

The pathology of the condition, notwithstanding the attention which has been devoted to it during the past fifty years, is not yet fully solved. Two main theories of the causation of these membranes have been propounded. These may be described briefly as the inflammatory and the hæmorrhagic respectively. Prescott Hewitt, in a paper read in 1845 before the Medico-Chirurgical Society, advocated the latter theory; but in 1854 Virchow published his views in favour of their inflammatory origin, and they were for many years those generally accepted by pathologists. Latterly Huguenin, in an exhaustive article in von Ziemssen's Encyclopædia, revives and strengthens Prescott Hewitt's theory, and pathological teaching in the English school seems to tend in the same direction.

According to the inflammatory theory, the thin gelatinous film, which is the earliest stage in the formation of the membrane, is the result of an inflammatory exudation. This becomes organised, and other membranes are formed on top of it, thus producing its laminated appearance. The hæmorrhages, which often occur between the new-formed membranes, are attributed to the rupture of the recently-formed vessels. The advocates of the hæmorrhagic theory, on the contrary, teach that the primary mischief is a hæmorrhage, and explain the laminated character of the membranes by assuming a succession of hæmorrhages. Most authorities are of opinion that the blood is derived from the vessels of the pia mater, which, owing to the loss of support produced by the atrophy of the convolutions, are particularly liable to bleed. A recent writer,[a] however, contends that the blood is derived from the vessels of the dura rather than the pia arachnoid, and that the cause of the hæmorrhage is not a mere "loss of support," but the gradually diminishing intracranial pressure exerting a suction action on the vessels similar to that produced by the process of dry-cupping.

[a] Article in the Journal of Mental Science for April, 1893. By Dr. Robertson.

Fig. 2

Fig. 1.

DUR HÆMATOMA ASSOCIATED WITH JACKSONIAN EPILEPSY.

Drs Eustace and Parsons

In the case under consideration the ease with which the tumour can be detached from the dura mater, and the absence of any marked thickening of the latter, would seem to point to a hæmorrhagic rather than an inflammatory origin.

The symptoms connected with hæmatoma of the dura mater vary considerably. In some cases they are in complete abeyance, while in others they suggest cerebral compression. In the light of the *post-mortem* examination it seems probable that the convulsive attacks in 1888, which chiefly involved the left side, were produced by a series of hæmorrhages over the right cerebral cortex. In process of time these became organised, and shortly before the patient's death a profuse hæmorrhage took place between the laminæ, and so produced the hæmatoma shown in Fig. 1. The extensive membrane covering the left cerebral hemisphere was probably formed about 1890, and manifested itself by convulsions involving chiefly the right side.

Bearing in mind the frequent association of dur-hæmatoma with general paralysis of the insane, the absence of the usual pathological signs of the latter at the *post-mortem* examination is interesting.

EXPLANATION OF THE PLATE.

Fig. 1.—Dur-hæmatoma with dura mater of right side attached—

a. Probe passed between tumour and dura mater.

b. Inner wall of tumour partly reflected, showing coagulated contents.

d. Inner aspect of dura mater covered by thin, false membrane.

e. Membrane detached from dura, and reflected on to tumour.

Fig. 2.—Pachymeningitis hæmorrhagica interna of left side—

c. Falx cerebri.

Art. XII.—*A Successful Case of Porro's Operation.*[a] By Nicholas Whistler Colahan, M.D., M.Ch.; Professor of Materia Medica and Therapeutics, Queen's College, Galway; Surgeon to the Galway Hospital.

The case I have the honour to bring under your notice is one of pregnancy occurring in a rachitic dwarf, in which it became necessary for me to perform abdominal section, delivery being impossible *per vias naturales*. Porro's Cæsarean hysterectomy was the proceeding I adopted to complete delivery. The operation was performed on the 16th of May, 1892, and was completely successful in saving the lives of both the mother

[a] Read before the Section of Obstetrics of the Royal Academy of Medicine in Ireland, May 26, 1893.

and her child. On the 18th of February last, nine months after the operation, I had an opportunity of showing both mother and child to some members of the Academy, who happened to be in Galway on university business. The case is interesting, and, as far as we in this country are concerned, it has still, to a certain extent, the attraction of novelty for us. On April 24th, 1891, I find Dr. Bagot described the first successful case of Porro's operation performed in Ireland. Dr. More Madden, in his recent communication to this Section, on the 28th of last month, I find, also, mentions a successful case. As far as I know this is the third, and the first, I believe, in which mother and child were saved. I dwell upon these facts, for I believe it would be both important and interesting to learn why abdominal section for obstetric purposes is rare in this as compared with other countries, for there is no doubt that both Cæsarean section and the Porro-Cæsarean operation are growing rapidly in favour in England, as well as on the Continent and in America. Is it that cases are not forthcoming suitable for these proceedings? or is it that we still prefer the time-honoured methods whereby the instrumental death of the child gives, as we were wont to think, greater hope for the safety of the mother, and that we refuse to recognise, except in a few exceptional cases, conditions which would warrant us in advising or undertaking abdominal section. [Photograph of patient here shown.]

Case.—This little patient, B. C., a rachitic dwarf, forty years of age; 39 inches high; unmarried; menstruated last in July, 1891; became pregnant in August, 1891, was admitted to lying-in ward of hospital on Saturday, 14th May, 1892. On Sunday, 15th May, labour, at term, set in; pains rather irregular; ordered an opiate. On examination I found it difficult to reach the os, which was drawn very high up, but the promontory of the sacrum was discovered protruding as a sharp wedge, leaving the conjugate under two inches. It was evident that delivery could not be effected through the natural passage, and, after consultation with my colleague, Dr. Lyden, it was decided that abdominal section should be resorted to, and I determined to send the patient to the County Infirmary, where I could most conveniently perform the operation, and where I would further have the advantage of having the after-treatment carried out by an excellent nurse. Accordingly, on the evening of Sunday, 15th May, the patient, in charge of an experienced midwifery nurse, was taken to the Infirmary. It is important to note here that the pains which had been very irregular during the day, and had almost

Dr COLOHAN ON PORRO'S OPERATION.

From Photo.

F Huth, Lith^r Edin^r

disappeared towards evening, again set in, perhaps owing to the excitement of having to leave for the Infirmary, and before reaching the latter place the membranes gave way, and the waters were discharged. However, on being made comfortable in bed and an opiate administered, matters again became quiet, and late on Sunday night my resident pupil at the Infirmary reported to me that the patient was very quiet, and taking her nourishment. Early on Monday, the 16th, my colleague, Professor Lynham, also saw the patient with me, and we decided that abdominal section should be performed as soon as possible. Accordingly, all necessary arrangements were made. An airy ward with single bed was warmed up with a small fire. The carbolic spray was allowed to impregnate the atmosphere while the other arrangements were progressing. A small narrow table near the window was used to operate upon. A few sponges wrung out of a 1 in 40 carbolic solution, boracic absorbent wool, and alembroth gauze, were the dressings used. Silver sutures were, in the absence of reliable gut or silk ones, arranged for the abdominal incision, and the instruments selected were extremely few and simple; finally, a solution of perchloride of mercury, 1 in 4,000 of boiled water, was used to sponge out the peritoneum and other exposed parts.

I believe the success of these proceedings depends much upon the rapidity with which they are carried out, and I believe that rapidity, with strict attention to details, depends entirely upon a perfect understanding between the operator and his assistants. I therefore wrote out, as shortly as I could, on a slip of paper, directions for each assistant—what I wished him to be prepared to do for me, and the period of the operation when I would require his services. I was very pleased with the result. There was neither flurry nor anxiety; I felt that every movement and wish of mine was followed and anticipated, and not for one second from start to finish was there a check in the operation, which occupied under twenty-five minutes. I merely notice one or two difficulties that arose during the operation. I mentioned that the waters had already been discharged; this rendered the abdominal wall very lax; the uterus was further tilted to the left side, and it was quite impossible to be certain that the external incision was in the line of the linea alba. I was obliged to open the sheath of the rectus, and passing a probe between it and the musele on either side, I found I was fully an inch to the left of the middle line. This may be a point of importance. The abdominal incision reached from the umbilicus to within about two inches of the pubes; and although the uterus was well pressed forward into the abdominal incision, yet several coils of distended bowel leaped out on all sides, and were it not for the inevitable flat sponges would have given serious trouble. It is a pity that these said sponges have such a tendency at the most critical period of the operation to conceal them-

selves, and remain behind. I was not spared this experience, but the sponges were previously numbered, so the delinquent was quickly discovered.

The uterine incision was done by cutting; no effort was made to fix the placental site, but a small incision was made in the middle line at the fundus; two fingers were introduced, and, using these as a guide, with a probe-pointed bistoury the thick uterine wall was quickly run through, down to the pubic end of the abdominal incision. I was glad I determined to cut, for the uterus having contracted after the waters were discharged, the thick walls would not, I fancy, have torn kindly. Two or three sinuses bled to an alarming extent, but were quickly controlled. The contracted uterus jammed the infant so tightly down in the pelvis, that I was obliged to take the probe bistoury again and extend both the uterine and abdominal incision downwards. Even then with difficulty was the child liberated. It was a full-sized infant, with a well-marked hydrocephalic head, and, a further difficulty, the funis was twice coiled round its neck. The cord was clamped and cut, and the child given to the nurse. I think this is a critical period in the operation. The child having been liberated, the uterus very suddenly becomes small, and ceases to fill the abdominal wound as it did, therefore fluids and blood can more easily enter the abdomen. Further, the distended bowels, kept in restraint till now, burst out on all sides, greatly to our embarrassment. In this way they get covered with blood and other fluids, which they carry back into the abdomen to the danger of the patient. To meet this difficulty I thoroughly sluiced the protruded bowels each time they appeared with the perchloride solution before returning them to the abdomen. It is a good practice, for it saved what would have been afterwards a troublesome peritoneal ablution.

I was obliged to remove the placenta while the uterus was still in the abdomen. It was a large one, and to have taken it away with the uterus would have necessitated some forcible tugging. All through this period Dr. Lyden, with a finger in each end of the incision, kept the uterus well pulled forward, and when everything was ready swept it out of the abdomen, and, giving it a half turn, brought it down towards the pubes. This effectually stopped all hæmorrhage, and I was able quietly to suture the abdomen with seven silver sutures—the first drawing the abdominal wall tightly round the pedicle, the other six embracing the entire thickness of the abdominal wall and peritoneum. The uterus was now put well on the stretch, and two stout steel pins shoved through the utero-vaginal pedicle. I had not a serre-nœud, and I was not certain of the elastic ligature I had with me, so I encircled the pedicle below the pins with a double strand of stout whip-cord. This I certainly would never do again. It was, I think, the one weak spot in the operation, and nearly cost my patient her life.

The uterus was now cut away, the stump shaped and dressed with iodoform, alembroth gauze, and boracic wool. The abdominal incision was dressed separately in the same way; and, finally, a warm flannel binder was drawn firmly over all. The A. C. E. mixture was the anæsthetic used by Professor Lynham. There was some vomiting afterwards, which, fortunately, did not last very long. On the whole, the little creature bore the operation remarkably well, and when placed in bed expressed herself as comfortable. It was evident, however, that she was very weak, and I kept near her for some time. It was well that I did so, for in a very short time, perhaps owing to effort of vomiting, I noticed that the wool plug over the pedicle was saturated with blood, and I at once saw that the stump was bleeding freely. This very undesirable accident would not have occurred with the serre-nœud, nor with the elastic ligature; in fact the serre-nœud would have been the proper instrument here, where the pedicle was healthy and fleshy, the elastic ligature when it is poor and friable. However, having neither, I applied another coil of whip-cord beneath the pins, applied the thermo-cautery freely to the bleeding points in the stump, and all appeared right again. The shock to the system after Porro's operation, where there is not only an abdominal section, but, in addition, the removal from the body of an important organ, is the one great drawback to this proceeding. It is well to bear this in mind, and I believe the patient should be well supported from the first. In this particular case, milk, Brand's beef jelly, and iced champagne were given rather freely at stated times. The temperature never rose above 101°, which it reached on the third day, never afterwards. On the seventh day, while dressing the stump, the patient got a severe rigor. Soon after enormous distension and tympanites set in; one of the sutures gave way, and had to be replaced, in order to relieve the strain on the others, but the prompt use by the nurse of O'Beirne's tube relieved the flatus, and an enema moved the bowels, and what appeared an impending attack of peritonitis was averted. It is at such moments as these that skilful nursing saves the position, and turns the tide in our favour. On the eighteenth day the pedicle came away, and at the end of the third week the little patient was permitted to move about, and the infant seemed nothing the worse for his novel method of entering the world.

It may be asked—why did I not adopt the true Cæsarean section with uterine sutures, instead of removing the uterus after Porro's method? Well, I am as suspicious of the absolute reliability of statistics as most men—yet when we are in doubt and anxiety we find ourselves consulting them, and they often sway us one way or the other.

In my hurried search I gathered—1st. That in a general way at least Porro's operation is the easier and more rapid proceeding—tedious uterine suturing being avoided. 2nd. I fancied I learned that a *true Porro's operation, with a sound uterus and a viable fœtus*, carefully done, and at a proper period, is at least as successful as the most carefully performed Sanger or Cameron-Cæsarean section. And lastly, looking at my little patient, and learning from the experience of others that these little people having escaped from the dangers of one pregnancy have a peculiar facility of getting entangled in a similar predicament again, I saw no reason why I should hesitate to deprive her of the chance of such a calamity, and myself, perhaps, of a further period of trouble and anxiety.

I have to express my thanks for being permitted to bring this case before you at this very advanced period of the Session, when many pressing matters have still to be considered. I trust, however, it may be useful in inducing others to pause before habitually resorting themselves, or advising others to resort, to the older method of infantile mutilation in obstructed labour to the exclusion of abdominal section; and useful further in proving that with strict attention to details, and with careful antiseptic precautions, this very serious obstetrical operation can be undertaken with a very fair chance of success.

Art. XIII.—*Hydronephrosis.*[a] By Conolly Norman, F.R.C.P.I.; Superintendent, Richmond (Dublin District) Asylum.

A case of true obstructive hydronephrosis is sufficiently rare to merit a brief notice in this Section.

Case.—The woman from whom these viscera were removed was a patient in the Richmond District Asylum, Dublin, for little over a year. As is the case with too many of my patients, received from the police courts, and certified at sight, there was no history of any trustworthy kind. However, there could be no doubt that the woman had led a very loose life in every way. On admission she suffered from general paresis. Mentally her symptoms were those of the tranquil and demented type of that affection. She presented no distinct indication of syphilis. She never exhibited any symptoms pointing towards renal or urinary trouble. In the spring of 1892 she contracted influenza, a very severe form of

[a] Read before the Section of Pathology of the Royal Academy of Medicine in Ireland, January 13, 1893.

which was epidemic in the institution at the time, and she subsequently developed pneumonia with pleurisy, of which she died after a short illness. There is nothing special to be noted in the symptoms or course of the lung affections.

Post-mortem.—The nervous centres exhibited the usual lesions of general paralysis. There were no signs of syphilis in the other viscera. Heart normal. Patches of atheroma in the aorta. Middle and lower lobe of right lung in a state of red hepatisation passing into grey below. The pleural surface of the hepatised lobes was covered with a very thick layer of yellowish lymph. Liver very slightly cirrhosed. Spleen large and soft. There were well-marked signs of chronic cervicitis, otherwise the genitalia were normal.

The right side of the abdominal cavity was occupied by a large tumour, which had displaced the intestines and pushed up the liver. It was evidently the right kidney converted into a large multilocular cyst with a leathery wall and fluid contents. The tumour was distinctly loculated, but not so deeply as in cases of congenital cystic kidney, and the loculi were few in number—some six on the surface of the kidney which lay anterior. In greatest vertical length the tumour (sacculated kidney) measured 21 centimetres (about $8\frac{1}{4}$ inches), its horizontal circumference at the hilum was about 20 centimetres (say $7\frac{7}{8}$ inches), but its circumferential measurement varied at different parts owing to the degree of bulging of the sacculi, &c. The kidney contained almost 22 ounces of clear inodorous fluid, containing a few sparkling particles, a few small flakes of a whitish greasy-looking substance. A section made in the usual plane shown that the kidney consisted of about ten sacs of different sizes, the largest being at the superior and inferior extremities. Some of these loculi were not perfectly separated from each other; others were shut off from the rest by tough fibrous dissepiments, which closed in towards the centre in such a way that the loculus communicated with the dilated pelvis by a funnel-shaped opening. Ridges of a similar material divided the loculi, which were not completely shut off save at the funnel-shaped opening. Some of the loculi were not slit up by the ordinary incision, but their opening into the pelvis was evident.

To the naked eye there was no trace whatever of normal kidney structure; the mass presented simply the appearance of an agglomeration of leathery-looking sacs opening into a common cavity by generally narrowed mouths, and circumscribed by a common wall which preserved the general outline of an unusually lobulated and much magnified kidney. The outer wall of the loculi, representing the cortex of the kidney, varied in thickness from $1\frac{1}{2}$ to 5 millimetres, but the general thickness, which was pretty uniform, was little under 2 m. The trabeculæ between the sacs varied in thickness from 2 m. to $1\frac{1}{2}$ centimetre. The larger showed a very distinctly fibrous structure, and cut like strong fibrous tissue. One

large mass which lay at the base of several loculi, separating them from the pelvis, cut with gristly firmness, and contained within fibrous walls a quantity of fat. The right ureter was throughout dilated, save at its lower extremity, and its wall was much thickened. About its middle third there was a remarkable fusiform dilatation for about three inches of its length. Towards the lower extremity the ureter somewhat abruptly narrowed, and became converted into a tough rounded cord without lumen for about one inch from the bladder. The latter viscus seemed perfectly normal, save that it presented no trace of an opening for the right ureter; the mucous membrane in this position was quite smooth, and showed no sign of old inflammation. The left ureter was normal. The left kidney was very large, but both to naked eye and microscopic examination the structure was normal, the enlargement being no doubt compensatory. The glistening particles which occurred in the fluid in the right kidney and ureter proved to be scales of cholesterin crystals, and the whitish flakes were chiefly composed of cholesterin, mixed up with what appeared to be epithelial *débris*.

The most remarkable appearance which the specimen presented has yet to be referred to. This is still well shown, as the kidney which is before the Section was preserved in one of the chrome fluids, and has undergone little or no change in aspect save for a darkening of colour. I refer to the peculiar shaggy appearance presented by the entire of the internal surface of the saccules of the kidney, and of the pelvis, and of the ureter, as far as it is pervious. On close examination with the naked eye, or better, with a simple lens, this roughening of the internal aspect of the organs is seen to be due to minute elevated lines running irregularly all over the surface and intersecting in all directions. This appearance I have not been able to find described anywhere in connection with any form of dilatation of the kidney, and I think it must certainly be rare. It is not presented by any museum specimens which I have seen. I have brought here three other specimens from my own museum, exhibiting various degrees of obstructive dilatation of the kidney, but none of them exhibit any resemblance to the condition described. One presents considerable dilatation of a kidney, the secreting structure of which has been much contracted by ordinary gouty cirrhosis, in a man who suffered from stricture of the urethra. The second specimen is a good example of the changes in the urinary organs which supervene upon vesical calculus. The bladder is small and enormously thickened. It contained a rather large calculus. The ureters

are widely and unequally dilated, ridged in parts, and in parts constricted, and the right shows an almost perfect valve. The kidneys are dilated and sacculated—excellent examples of "surgical kidneys." These organs were removed from the body of a patient who died of uræmia immediately after I took charge of the Richmond Asylum.

The third specimen is the urinary organs of a male patient, who died recently in the asylum of villous cancer of the bladder. The earliest symptom had been violent hæmorrhage from the bladder about a year and a half before death. Later on intense pain appeared, referred chiefly to the flanks and loins. The growth sprang from the trigon, and had obstructed the orifice of the left ureter, so that it was somewhat difficult to inject a stream of water from the ureter into the bladder. It had altogether blocked up the opening of the right ureter. It will be seen by the way the right ureter is double, presenting this condition, that two distinct tubes arise, one above another, from the pelvis of the ureter, run quite separately for about half their way, then adhere, but form two separate channels almost the entire remainder of their course, and unite just outside the bladder by obliteration of their adjacent walls. The left kidney is in an early stage of sacculation, the right in a more marked condition of the same state.

Now all these three specimens show the same perfectly smooth condition of the internal surface of the kidney and also of the ureter. The ureter of the patient with the cirrhotic kidney shows a rugose condition of the whole thickness of the wall, but the mucous membrane itself is perfectly smooth. Similarly with the case of stone, though there are ridges and constrictions, and something approaching to valves, the mucous membrane retains its normal smoothness and glister.

The smooth condition of the interior is mentioned in every description of the sacculated kidney or hydronephrotic kidney of obstruction which I have come across.

Under the microscope the walls of the hydronephrotic kidney which we are examining are seen to consist chiefly of adult connective tissue, showing here and there in every specimen examined tubuli uriniferi, and, in some, distinct glomeruli. The tubuli are generally exceedingly small, and often have a hardly distinguishable lumen. The glomeruli, also, are highly degenerated. Both are often filled with a dense mass, staining deep red with carmine (colloid). The elements are arranged thus:—In the outer walls

of the sacculi, forming the wall of the kidney, dense connective with a few elongated nuclei lies outside; within is a layer of connective fibres, among which are the remains of glandular tissue with frequent masses of small round cells. These masses run in bands parallel to the direction in which the fibres and tubuli run in the long axis of the sections made in a vertical plane. Internal to this layer lies a layer of swollen-looking connective tissue fibrils, staining imperfectly or not at all in carmine or logwood, rising at irregular intervals in loose concentric loops, which form the small ridges visible to the naked eye on the internal surface of the sacs. Scattered on the surface of these elevations, and gathered in little heaps between them, are granular-looking masses, which stain a dirty yellow in carmine and a greyish tint in logwood, and which recall the masses of epithelial debris which we find in place of the tubuli in advanced cases of cirrhosis. From these heaps bands of a similar material, mixed, in some places, with small round cells, run down diagonally between the elevations to join the clusters of small cells in the lower layer.

Exactly the same conditions are found in the dissepiments between the various loculi. Here a broad band of white connective tissue, with few elastic fibrils, forms the central portion of the walls; the other layers occur on each side.

The thickened ureter shows on its surface a layer of swollen fibres rising into elevations, with epithelial or inflammatory debris accumulated between them, and thinly scattered on the surface.

The sections presented show all the appearances above described.

That the destruction of this kidney and its conversion into a sort of multilocular cyst depended upon the closure of the right ureter at its opening into the bladder seems evident. I should say, from the remains of secreting structure still to be found, that this closure occurred after the kidney had begun to functionate.

What gave rise to the closure of the ureter is not clear. Possibly it was due to gonorrhœal cystitis.

The peculiar roughened state of the internal surface of the ureter and kidney, together with the microscopic find, suggests a chronic inflammatory condition of the lining mucous membrane, but why this condition should arise in this particular case I am at a loss to say. The state of the ureters in the case of stone exhibited, seems to indicate that they were damaged by the passing of gravel or small calculi, yet their mucous membrane retains its smooth aspect.

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Manual of Bacteriology for Practitioners and Students, with especial reference to Practical Methods. By Dr. S. L. Schenk, Professor Extraordinary in the University of Vienna. Translated from the German (by the Author's permission), with an Appendix, by W. R. Dawson, B.A., M.D., Univ. Dubl.; late University Travelling Prizeman in Medicine. London: Longmans, Green & Co. 1893.

To add another to the many text-books of bacteriology that have appeared within the last few years both at home and abroad would at first sight appear superfluous. When there already exists an adequate "up to date" literature dealing with a given subject, some apology or excuse is generally made for the appearance of a new aspirant to public favour on the same lines. At any rate, some explanation of the new book's *raison d'être* is usually given—and expected; for the production of new text-books without special features, whether of contents or arrangement, to recommend them, is admitted on all hands to be a waste of energy uncalled for as it is injudicious. The volume now before us seeks admission to the shelf already groaning beneath the weight of Crookshank, Woodhead, Griffith, Migula, Sternberg, Cornil and Babès, Fränkel, Flügge, &c., and therefore, the translator's and author's prefaces were first of all consulted in order to find out the particular feature to which these gentlemen point as the *raison d'être* of this new text-book of bacteriology.

In the first sentence of his preface the author tells us that "the methods of investigation have been dealt with as thoroughly as possible, special attention being paid to the elementary technique." How far this claim is justified we shall see presently. The third sentence in the preface is a rather mysterious one, and we give it *in extenso* for the benefit of the ingenious reader:—"Particular attention has been given to the pathogenic micro-organisms, and so much the more regard had to be paid to the chemical relations of the life of bacteria, and to their biology generally, that recent

events give us reason to hope for an extension of our therapeutic powers from this direction." Reiterated perusal of this phrase makes one suppose that Dr. Dawson must have become infected with some of his author's Teutonic obscurity; and this supposition is strengthened on reading the next paragraph:—"Engravings of the most important bacteria have been provided, showing their form and the appearances presented by their growth. These are intended to serve the reader as models of the typical forms, to which he may be able to adhere in his own investigations."

Turning now to the body of the book, we are struck on reading the first few pages with an absence of any biological classification. The author gives no definition of what he means by micro-organisms, further than that (p. 2) "they belong to the following different classes, viz.—*bacteria*, *moulds*, *yeasts*, *algæ*, and *protozoa*." Under the head of *algæ* (p. 12) he says, "Of these the *cladothrix*, *crenothrix*, and *beggiatoa* varieties belong to the micro-organisms." These genera are thus reduced to the level not merely of species, but of mere varieties, not worthy of a capital letter; and no reason is given why these, and these only, are included amongst the "micro-organisms," whilst allied genera, equally minute, are "left out in the cold."

The only other piece of information imparted about these varieties will, doubtless, prove novel to the scientific botanist—"They are jointed filaments which multiply, not by fission, but by *germination* at their extremities." [The italics are ours.] On the same page we are told that yeasts "possess neither spore-bearing organs nor spores"; and another surprising statement also on the same page is, that "of the protozoa those important as regards bacteriological investigation are the *sporozoa*, which include the *gregarinæ*, *psorospermii* (*sic*), and *coccidia*. They are unicellular organisms which can only live in a moist or liquid medium, and in the absence of water, nutrient material, or oxygen, are transformed into roundish durable cysts." It might fairly be asked whether any protozoa can be called important as regards bacteriological investigations? and whether they cease to live on being transformed into cysts? and also whether the transformation in question is really dependent on the conditions mentioned, and not part of the necessary life-history of the species? In a book that ought to be exact such looseness can result only in imparting superficiality of view and inaccuracy of knowledge—intellectual defects that can hardly fail to be

contracted by the inexperienced reader who obtains his first notions of bacteriology from this text-book. The introductory pages contain many errors, some of them actually comic. Thus, protozoa (p. 12) are said to "possess a sort of larval condition consisting of irregular and roundish little masses of protoplasm which move by means of processes projecting out like limbs. . . . . The contents of the cyst separate by division or gemmation into particles called *sporocysts* or *pseudonavicella*" (*sic*).

We seem to have gone back into the early part of the century when we read (on page 10) that "the moulds form special seed-bearing organs called *hyphæ* or *thallus*," and that "according to the form of the seed-bearing organ they are divided into *mucorineæ*, *aspergillineæ*, *penicilliaceæ* and *öidiaceæ*," and this written by a contemporary and fellow-countryman of the illustrious Brefeld! The scarcely scientific term "knob," is employed by the translator of this interesting classification. "In the *mucorineæ* (or headed moulds) the ends of the hyphæ swell into *knobs* (*columella*), around which a seed capsule or sporangium forms. . . The *aspergillineæ* (*knob*-moulds) have the *knobbed* ends of the hyphæ covered with a variable number of spore-carriers, &c. . . The hyphæ of the *penicilliaceæ* (pencil moulds) are branched, which is not the case with the mucor and aspergillus *varieties*."

The same superficiality and inaccuracy are especially noticeable in the descriptions of elementary technique, which the preface led us to hope would be of a peculiarly explicit character.

In the description (on p. 82) of the celloidin method no directions are given as to the size of the pieces of tissue, or as to the position of the knife in section-cutting, and the period (at least 24 hours) assigned as sufficient for the celloidin impregnation is not nearly long enough save for quite small pieces, if "the finest sections" are to be obtained. The paraffin method is next described, but no mention is made of oil of cedar-wood as a vehicle, although it is deservedly one of the most widely employed agents, nor is anything said about the melting point of the paraffin and the relation it must bear to the temperature of the room. Yet this is an essential point if good sections are to be obtained.

One more example of Professor Schenk's method will suffice. Here is how he described the freezing method of sectioning tissues: "In order to be able rapidly to examine pieces of organs, recourse is had to the freezing microtome. The substance in the fresh

state is laid on a roughened metal plate and frozen by means of an ether spray apparatus. It is then cut into sections with a cooled knife, and these are laid on slides allowed to thaw, subjected to staining processes, which will be described later on; after which they are most conveniently examined in glycerine."

All this seems very simple, but the beginner who attempts it with no other guide than Professor Schenk's account will soon find it a more troublesome matter than he anticipates. He is not told—

1st. How to prepare the tissue for section cutting.

2nd. How the cooled knife is to be guided.

3rd. How his sections are to be got on to the slide, and, finally, he is led to believe that sections of fresh (*i.e.*, unfixed) tissue can be successfully stained: which is not the case, in bacterial work at any rate.

After reading Professor Schenk's account of histological methods, one is forced to ask—What is the use of it? Why not, once for all, refer the student to some practical text-book of histology? The experienced worker who comes on these pages of sketchy and imperfect description will pass by with a smile. The inexperienced student or practitioner who may attempt to stain bacteria in tissues "off his own bat" with Professor Schenk as his guide, can hardly fail to fall into every one of the numerous pitfalls with which this sort of work is beset, and throw up the whole thing in disgust.

Having dealt thus at length with some of the defects that disfigure this text-book, there still remains to be fulfilled the more agreeable part of our task—to signalise the merits which the work undoubtedly possesses. It contains a brief systematic account of the various organisms contained in air, water, earth, putrefying substances, articles of diet, such as milk and beer, in pus, fæces, urine, and on the surface of the human body as well as in its various cavities. The list of species dealt with is very complete, and can hardly fail to be of service to the investigator who is occupying himself with bacteriological analyses. It would have been infinitely more useful though, if the necessarily meagre details given in the text had been supplemented by references to the original sources. This omission is a grave one, and will materially detract from any utility which the work might otherwise possess. No less than thirty different species of organisms are described as occurring in atmospheric air, including some of the pyococci, the details about

which would have found a more natural position in the chapter on pus.

At the end of the book is an appendix in which Dr. Dawson steps in with good effect, to complete his author and supplement some of his deficiencies—*e.g.*, as regards the freezing method and fixation solutions. He also brings the book up to date by adding useful chapters on Haffkine's cholera-vaccine, parasitic protozoa, and the action of light on micro-organisms. It is strange that he does not include 1 per cent. osmic acid nor Foà's reagent in his list of fixatives for cancer "protozoa," and the period he assigns for "washing out" Flemming-objects (three to six hours) is much too short. Dr. Dawson's own style is occasionally disfigured by a certain amount of obscurity. Witness the following sentence in which he sums up the cancer-debate:—"Upon the whole it may be said that the weight of probability is on the side of the parasitic view, but its influence on the tissues is at present unknown."

The publishers, Messrs. Longmans, Green & Co., have done their utmost to make the book as attractive as possible: and in this they have succeeded. The paper is excellent, the print distinct and well spaced, and the margins are wide. Indeed both author and translator are to be congratulated on the really first-rate style in which their work is presented to the English reader.

On Diseases of the Lungs and Pleuræ, including Consumption. By R. Douglas Powell, M.D. Lond.; F.R.C.P.; Physician Extraordinary to H. M. the Queen; Physician to the Middlesex Hospital; Consulting Physician to the Hospital for Consumption and Diseases of the Chest at Brompton. Fourth Edition, with Illustrations. London: H. K. Lewis. 1893. Pp. 600.

We welcome with much pleasure the fourth edition of this truly admirable work—a work which represents the extended experience and mature conclusions of one of our most distinguished English physicians. It is a work from which the experienced practitioner cannot fail to derive profit, while even the junior student can read it with ease and advantage, so clearly is it written. This edition has been thoroughly revised and brought up to date, and the more important results of recent investigations as to the nature of Tuberculosis, its mode of spreading and appropriate prophylaxis, have been incorporated in it. We look on Dr. Powell's "Diseases

of the Lungs and Pleuræ" as one of the best books that has appeared on the subject.

The first chapter relates to the anatomy and physiology of the chest. The chief point that Dr. Powell calls attention to is that when the normal chest is at rest, and all muscles are relaxed, the natural tendency of the lungs to contract is exactly balanced by the tendency of the ribs to expand. In health, throughout ordinary inspiration, the limit of thoracic recoil is barely reached, hence the thoracic elasticity is a reserve force of appreciable power constantly tending to enlarge the thorax, and therefore acting in favour of inspiration. In this he appears to be stating a fact which is generally overlooked or misunderstood, but when he goes on to say, "the sole resistance to be overcome by the inspiratory muscles is that of the lungs," he is surely forgetting that the inertia of the air must also be taken into consideration. A certain amount of force is used up in setting the air in motion.

The next two chapters treat of the Examination of the Chest and of the Sputum. They are exceedingly well written, and that on sputum contains some good illustrations. There are also four very good coloured plates illustrative of Tubercle Bacilli, Actinomycosis, and Membraneous Bronchitis. The formula, however, for preparing Neelsen's solution for straining tubercle bacilli is given quite wrongly.

The remaining portion of the book treats of the various pulmonary and pleural diseases, much the largest space (over 230 pages) being devoted to Tubercular Diseases. It is difficult to pick out any points for special commendation when all is so excellent. The clinical histories of many illustrative cases are published at length, with full records of *post mortem* appearances in those cases that proved fatal. Indications for treatment are given with care and minuteness. The value of change of air and scene, and the advantages and drawbacks of numbers of health resorts, are fully discussed. The author's conclusions are characterised by a painstaking and judicial impartiality.

With regard to the action of microbes in exciting disease, Dr. Powell seems to have some difficulty in ascribing much importance to them (always excepting the tubercle bacillus). Thus in writing of empyema he says:—"What the conditions are that determine suppurative rather than simple pleurisy we do not precisely know, and we have to speak of 'depressed conditions of the system,' 'morbid constitutional states,' and the like. We may, indeed,

with some plausibility maintain that some morbific agent present in the blood renders the inflammation purulent rather than serous, as in the joint affections in pyæmia, though the pus-producing quality in the blood is very difficult to estimate, and would seem to be of varied sorts." Then the author goes on to state that tubercle bacilli have been found in tubercular purulent effusions, and quotes Professor Kiener, of Montpellier, as to the presence and influence of several other organisms. We think this is a very poor account of the pathology of empyema. Many investigators of, at least, equal eminence with Professor Kiener have carefully studied the subject experimentally, and have considerably advanced our knowledge; and we think that Dr. Powell might have devoted a little more space to the consideration of this subject. On the other hand, the treatment of empyema is admirably discussed, and full details are given as to the best mode of operating.

The section on Consumption is wholly admirable. No one can read it without being impressed with the careful way in which the varieties of this disease are described, and their distinguishing features as regards prognosis or treatment pointed out.

In such a complete work as this we were surprised to find no account of Malignant Disease either of the Lung or Pleura. The subject of Circulatory Disturbances in the Lungs is also overlooked. We hope that these omissions may be rectified in the next edition.

We have found fault with a few points, but, after all, these are of very minor importance, and do not in the least interfere with the very high opinion we have formed of the work. We recommend it to all our readers who need a first-class work on Diseases of the Respiratory Organs.

A Text-Book of the Theory and Practice of Medicine. By AMERICAN TEACHERS. Edited by WILLIAM PEPPER, M.D., LL.D.; Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania. In two volumes. Illustrated. Vol. I. Philadelphia: W. B. Saunders. 1893. Pp. 909.

"IN the preparation of this work," we read in the preface, "some of the teachers of practical medicine in the leading schools of America have associated themselves in order that each subject should be discussed by an expert of special authority. It may

then be said to represent truly the best teaching of the Science and Art of Medicine at the present time in this country." "The articles are not written as though addressed to students in lectures, but are exhaustive descriptions of diseases with the newest facts."

This is a high ideal; let us see how far it has been attained.

The first article is on Hygiene, by Professor J. S. Billings, occupying 44 pages. It is well written, as far as it goes, but cannot be said to be more than a sketch, containing the general principles of the subject, which may serve to assist the memory of a man who has already studied larger works, but which is too short to be of very much real value. It is not possible to teach very much about sewage disposal and sanitary appliances in four pages, or about ventilation in five. This article, too, has no illustrative figures.

The next section is on Fevers—the Continued Fevers, with Cerebro-spinal Meningitis and Influenza, being treated of by the editor, Dr. Pepper; and the Exanthemata, together with Anthrax, Hydrophobia, Trichinosis, Actinomycosis, Glanders, Tetanus, and some other diseases, being alloted to Dr. J. T. Whittaker, Professor of Medicine in Cincinnati. For this section we have nothing but the highest praise. These authors have, in our opinion, succeeded in attaining the ideal of the preface which we have quoted. The description of each disease is readable, exhaustive, modern, and reliable in a marked degree. Take, for example, Trichinosis—a somewhat rare disease in this country, at any rate, and one which in many text-books is passed over briefly. There is first a complete history of the disease, relating the various steps by which the nature of the disease became known, from the discovery by Hilton of minute white masses in muscles, to the observations and experiments of Zenker and Virchow, who succeeded in causing experimental trichinosis in rabbits by feeding them with muscle from a patient who had died of the disease. The life history of the trichina is then described, and its appearances in muscle, the subject being illustrated by a number of very good woodcuts. The symptoms, diagnosis, and treatment are then fully described, especial stress being laid on diagnosis—a most important matter in the case of an uncommon disease. The whole forms a complete and excellent monograph on the subject.

The articles on more common diseases, such as our own familiar Typhoid, are equally good, being sound and practical, and written

by physicians who write of their own experience and not of the latest fads. A number of useful prescriptions are given in full.

Tuberculosis, Syphilis, Diphtheria, Cholera, and some other diseases are described by W. Gilman Thompson, M.D., Professor of Physiology in New York University. The article on Diphtheria is exceedingly complete, and calls for especial mention as giving a better account of the bacteriology of the disease and of recent investigations on the subject, such as those of Behring and Kitasato, than do most other works on medicine, even including those recently published. With regard to Intubation *versus* Tracheotomy, Dr. Thompson seems somewhat to favour the first mentioned procedure.

Dr. Thompson's article on Malarial Fevers is also admirable. The plasmodium of Laveran is fully described, and several coloured engravings represent the microscopic appearances presented by blood containing the parasite.

The second part of the work treats of Mental and Nervous Diseases, and has been written partly by Dr. W. Osler, of Johns Hopkins University, and partly by Dr. H. C. Wood, of the University of Pennsylvania.

There is a good article on Mental Diseases by Professor Wood. He divides insanities into three classes, following Krafft-Ebing:—I. Complicating Insanities, the outcome of a distinct organic disease of the brain, and not dependent on acquired or inherited constitutional diathesis. II. Constitutional Insanities due to some constitutional disease, such as gout, epilepsy, alcoholism, &c. III. Pure Insanities, which again are sub-divided into Functional Insanities, liable to occur even in persons who have previously shown no mental warp, and who may completely and permanently recover; and Neuropathic Insanities, the outgrowth of some original vice of nervous construction, such vice only manifesting itself by functional aberration. We cannot see that this classification is well worked out, or is likely to serve any good purpose. Thus the Terminal or Secondary Dementia, in which so many cases of mania terminate, is classified among the Functional Insanities, though it is perfectly incurable, and must depend on some organic degeneration of the ganglionic cells in the brain which subserve mental processes.

In the section devoted to Functional Nervous Diseases, we are pleased to find a good and practical chapter on "Sleep: its Disorders and Accidents"—a subject that deserves to be treated more fully than it usually is in works on medicine. In it sleeplessness,

morbid somnolence, night-terrors, &c., are discussed. With this part of the work, on the whole, we are disappointed. It is well written and clear, as far as it goes, but many of the articles are very short, and are more like what we expect to meet with in an elementary work for students than in a book which "represents the best teaching of America." The account of the morbid anatomy of the spinal cord is often very poor; thus the whole account of the pathology (including morbid anatomy) of spastic paraplegia is comprised in four and a half lines. There are no figures to illustrate the features of disease of the cord, and only a very few illustrating the clinical features of various diseases.

This part of the work cannot compare with many of our English works on nervous diseases.

On the whole, then, we have formed a very high opinion, indeed, of the part of this Text-Book of Medicine which treats of fevers and general diseases caused by animal and vegetable parasites, while we are rather disappointed with the section on Diseases of the Nervous System.

The Law of Psychic Phenomena: a Working Hypothesis for the Systematic Study of Hypnotism, Spiritism, Mental Therapeutics, &c. By Thomson Jay Hudson. London: G. P. Putnam's Sons. 1893. 8vo. Pp. 409.

We recommend this book to all our medical readers who take an interest in hypnotism as an example of what absurdities may still find advocates.

The following quotation is, we believe, sufficient:—"When mesmeric passes are made over a patient a fluid appears to emanate from the hands of the operator. An effluence of some kind certainly does come from that source, and one that is perceptible to the physical senses of the patient."

Army Medical Department Report for the Year 1891; *with Appendix.* Volume XXXIII. London. 1893. Pp. 402.

An easily-pleased contemporary considers that a Report twenty months late is furnished with "commendable promptitude." To us it appears that information supplied so long after date is certainly stale, and probably flat and unprofitable also. We shall notice only two subjects of its contents—recruiting, with respect

to the physique of the British army, and venereal diseases as a preventable cause of inefficiency.

61,322 men (and boys) were enlisted in 1891. An outsider is struck with the apparent carelessness in the primary examination, shown by the numbers subsequently rejected. 374 per 1,000 failed to pass on the secondary inspection, and 5 per 1,000 were found unfit within three months, making a total of 379 unfit in every 1,000 passed on first examination. Fluctuations from year to year are of little importance in a case of this kind; but we may mention that the rate of secondary rejections was *higher* by 19 in 1890. The rate is highest for England and Wales (385); Ireland being next (369); Scotland (341); and "British Colonies and Foreign Countries" lowest (318). Ireland supplied 116 recruits per mille. Why so many recruits should be accepted only to be rejected immediately, or within three months afterwards, is still more wonderful when we observe the causes of rejection; some of which, at least, ought to be detected on the most superficial examination. Taking from Table V. (p. 37) those causes which led to more than 10 per mille of rejections, we find them to be as follows:— Impaired constitution and debility, 19; defective vision, 40; disease of heart, 17; varix, 16; loss or decay of many teeth, 11; varicocele, 13; defects of lower extremities, 16; flat feet, 11; under height, 27; under chest measurement, 93; under weight, 32.

So much for the recruits we do *not* get. Let us see what manner of "men" are actually admitted to the British army. As to age: 360 per 10,000 were "boys under 17"; 4,751 per 10,000 were between 17 and 18. "Very nearly half—47·5 per cent—of the recruits passed fit for service in the army were between 18 and 19 years of age." As to height: 393 per 10,000 were under 5′ 3″, and 1,097 from 5′ 3″ to 5′ 4″. The largest number (2,077 per 10,000) measured 5′ 4″ to 5′ 5″. 58 per 10,000 were 6 feet and upwards. As regards capacity of chest: 335 per 10,000 measured less than 31″, and the preponderating measurement was between 33″ and 34″. Of the capacity represented by this, 12,791—3,358 per 10,000—were finally passed. In estimating the physique of an army the proportion of weakly men likely to break down on active service is the thing to be considered. Averages are useless, except as tests of improvement or deterioration. We quote, however, the passage in which the average results of the year's recruiting are stated and compared with those of 1890, italicising a few important words:—

"From the foregoing tables it has been calculated that, *excluding boys under* 17 *years of age*, the average age of recruits finally approved during the year was 19·2 years, as compared with 19·1 in 1890, the average height was 5 feet 5·6 inches, the same as in the previous year, the average weight 122·3 lbs., an increase of 2·3 lbs., and the average chest measurement 33·4 inches, as compared with 33·5 inches in the preceding year."

Let us now see the effect of venereal poisons upon the efficiency of this material. The total incapacity due to these causes is not stated in the report. It will sufficiently answer our purpose to take the Indian figures; especially as the efforts of the Medical Staff in India to check the actual and potential ravages of venereal diseases are being baffled and discredited. The European garrison in India exceeds 60,000 men. Of these, 5,309 were constantly inefficient through sickness—80 per 1,000. We are obliged to take the three commands separately. In Bengal the ratio of men constantly sick from *primary syphilis* and *simple venereal ulcers* was 12·40 per 1,000; for *secondary syphilis*, 6·07; for *gonorrhœa*, 11·47; total, 29·94 per 1,000; "representing a loss of 1,203·68 men to the efficient strength of the force." To this should be added other cases of venereal origin, "chiefly inflammation and suppuration of the lymphatic glands of the groin from venereal infection." These raise the rate to 30·9 per 1,000. Further: "While the admission ratio for secondary syphilis has risen from a quinquennial average (1886–90) of 40·8 to 60·2 in 1890, and 58·6 per 1,000 in the present year, the constantly sick rate has steadily increased from 3·78, the average, and 5·85 in the preceding year, to 6·07 per 1,000 in 1891, and the average duration of each case from 33·83 days, the quinquennial average, to 35·46 days in 1890, and 37·83 days in the present year."

In Madras 13·81 per 1,000 were constantly incapacitated by primary venereal sores; 8·92 by secondary syphilis; and 9·22 by gonorrhœa; total, 31·95 per 1,000. In Bombay the corresponding ratios were 13·63, 4·43, and 10·93; total, 29·00.

Six papers are appended to the report. The most important of these is Surgeon-Captain Lambkin's, *On the Hypodermic Administration of Mercury in the Treatment of Syphilis.* The method has been discredited in consequence of its alleged painfulness and its supposed tendency to produce tetanus and abscesses. In his hands the treatment has been most successful. Pain, he says, is obviated by the use of lanolin and carbolic oil, mixed into a cream,

with metallic mercury. No abscesses followed the injection of this "cream," and no pain was caused by the operations, which were nearly one thousand in number, in Mr. Lambkin's practice.

The Disease of Inebriety from Alcohol, Opium, and other Narcotic Drugs: its Etiology, Pathology, Treatment, and Medico-Legal Relations. Arranged and compiled by the American Association for the Study and Cure of Inebriety. London: Simpkin, Marshall, Hamilton, Kent, & Co., Ltd. 1893.

It is unfortunate that Societies bent on social reform should not confine their labours within their legitimate sphere. No profession is more sinned against than that of medicine: vegetarians, teetotallers, theosophists, and all other faddists attempt to forcibly drag medicine to do battle for them.

All our sympathies are with temperance advocates. We hold that drunkenness is a curse, and one which spreads misery far and wide; but, nevertheless, we love truth more than we abhor drunkenness, and must protest against the straining and forcing of medical teaching which we find in the volume before us.

Advantage is taken of names that have become historical to put forward views that have become obsolete and theories that have been exploded. For what other reason is Benjamin Rush brought forward in this volume? Had Rush not been the friend of George Washington he would have passed long since into deserved obscurity; as it was, the friendship cost Washington his life.

Again and again, numerous quotations giving half-truths, and often grossly inaccurate, are given, thus:—"Brühl Cramer, from a long examination of this subject, concludes that drunken parents are seldom prolific, and when so, the children are stupid, malicious, and full of mental defects."

Do we not find that the most prolific, intellectual, and progressive race in the world, the Anglo-Saxon, consumes more alcohol a head than any other?

The beer-drinking peasants of the Elizabethan age begot the most intellectual progeny the world ever saw.

If total abstinence conduces to intellectual superiority it seems strange that no negro ever did anything worthy of remembrance. The nearest approach to civilisation that teetotallers ever made was the Aztec rule in Mexico. Amongst civilised races teetotallers have done nothing but in season and out of season urge their fad.

In no branch of literature, science, or art has a teetotaller ever come to the front, and all of them that have passed beyond mediocrity since the beginning of the Christian era would not fill a tramcar. The book before us, with all its good intentions, is little more than a distortion of truth.

A Handbook of Local Therapeutics:—General Surgery, by R. H. Harte, M.D.; *Diseases of the Skin*, by A. van Hoelingen, M.D.; *Diseases of the Ear and Air Passages*, by Harrison Allen, M.D.; *Diseases of the Eye*, by G. C. Harlan, M.D. Edited by Harrison Allen, M.D. London: H. K. Lewis. 1893.

This is an unique work. In all other books on therapeutics the local action of the drug is subordinated to its general action. In this the local action alone is dealt with. That such a book is a convenience and of much value to the prescriber is unquestionable, but we hardly think that it is a necessity. The work, however, is well done, and the pages of the book abound with serviceable hints. We especially draw attention to the very valuable articles, "The Local Action of Remedies," "The Method of Using Remedies," "Local Treatment of Diseases of the Skin," "Local Treatment of Diseases of the Respiratory Tract," and those on the dressings of general surgery. There are two indices, one of remedies and one of diseases, both of which are very full.

To the busy man the book will be of great service in economising time and saving the labour of searching through pages of print for a local remedy which he will find this handbook gives at a glance.

A Guide to the Examination of the Urine. By J. Wickham Legg, F.R.C.P.; formerly Assistant Physician to St. Bartholomew's Hospital. Seventh Edition. Edited and revised by H. Lewis Jones, M.A., M.D., M.R.C.P.; Medical Officer in Charge of the Electrical Department in St. Bartholomew's Hospital. London: H. K. Lewis. 1893. Pp. 139.

This little book gives a good and concise account of the more ordinary methods of examining urine. In connection with each substance found in the urine its clinical significance is briefly

indicated. There are some illustrations of crystals, tube casts, &c., including several reproductions by photography of actual specimens of urinary crystals. We think, however, that a book of this size on the urine might have contained more illustrations.

An appendix describes the method of making a quantitative estimation of chlorides, urea, &c.

The directions are clear, and, as a rule, full. We only notice one serious omission: no mention is made of the fact that the addition of nitric or other acid sometimes causes a clear urine to become very turbid, owing to urates, which have been in solution, becoming insoluble in the more acid fluid.

In describing the guaiacum test for blood, a fresh solution of guaiacum in spirit should have been recommended instead of "tincture of guaiacum." The tincture often fails to give the reaction owing to its not having been freshly made.

Essays on Rural Hygiene. By GEORGE VIVIAN POORE, M.D., F.R.C.P. London: Longmans, Green & Co. 1893. Pp. 321.

THIS is a volume of essays, some of which have been previously published, whilst others appear for the first time; all, however, form a connected series. After an Introduction in which the essays are grouped together, there is a chapter on concentration of population in cities. England and Wales have about 18½ millions belonging to town, and 10½ millions to country districts. The reason is that railways, telegraphs, telephones, &c., render it easier to work from a centre, and so instead of increased facilities for travelling allowing people to live further away, it has the contrary effect. One of the results is physical deterioration and higher death and sick rates. A London fog has, in one fortnight, occasioned 1,442 extra deaths.

The existence of water under pressure has altered conditions of life, and houses are built much higher than in old cities. Now the number of people per acre is of the utmost importance, and, whether they live in tenements, model dwellings, flats, or residential mansions, overcrowding of ground space can exist. Water-carriage of sewage has made another change; formerly houses had to have enough curtilage to provide a well and a place for the disposal of sewage, but now a pipe brings in water, a pipe takes out sewage and a bin emptied daily does for other refuse, and so houses of enormous height, and holding

enormous populations are built in crowds with no curtilage to speak of. Height and population are everywhere in towns increasing and curtilage diminishing, and in country districts people are allowed to build houses with deficient curtilage and allotments will have to be provided at the cost of the ratepayers and at inconvenient distances.

Chapter II. deals with the importance of returning all used-up materials to the soil—the proper destiny of organic refuse; the best method is immediate burial just below the surface of the soil. Chapter III. is on the shortcomings of some modern sanitary methods, and the evils of water carriage are pointed out. The increase of death-rate towards the centres of dense population is shown. The author calculates that $\frac{1}{20}$ acre should be given to each family, and that the sewage should be used on this land; that would give, allowing for roads, some 64,000 people to the square mile, a quite sufficiently dense population.

The "Living Earth" is a continuation of the same plea of giving back the sewage directly to the soil; some interesting experiments as to filtration of urine, &c., through earth are given, the great power that the earth has to deal with organic liquids and solids being shown. Other chapters carry the argument still further, and the advantage of the old-fashioned privy over the more modern cesspool is shown and pipe drains are condemned:—

"Cesspools must be written down as the most immoral of all insanitary subterfuges."

"Closed sewers should only be resorted to in cases of the direst necessity, and with a full sense of their danger."

It will be interesting to note the effects of the recent substitution of a cesspool for a privy at a railway station not far from Dublin. The privy used by station officials and passengers was not emptied since the building of the railway until this autumn. A cesspool with good water supply, but, apparently, no overflow, has been substituted. It will probably arrange about its own overflow to the discomfort of those using the station, and do more evil than its foully-smelling predecessor!

The author gives an interesting account of his own experience at Andover, where he owns a garden of some two acres. It was waterlogged and unhealthy owing to small buildings near at hand; these he bought, removed drains, substituting pails, and made other improvements, the water fell nine inches and the

daily application of the pail contents (from some hundred individuals) has brought the garden to more than average fertility. With the pride that is at once so common and so pardonable in amateur gardeners, the author gives several plates of fruit and vegetables grown in his garden.

So enthusiastic is the author about nitrification, that he hardly gives cremation fair play. The alleged exaggerations of cremationists when speaking of the horrors of inhumation, cannot be greater than the author's exaggerations of the evils of cremation; and when the glories of nitrification have been descanted on, all the use that the author can suggest for cemeteries is to grow firewood in them. A small result after all, though it might lead to crematory and cemetery living side by side, one growing fuel for the furnaces of the other!

The book is one which cannot be read without interest and gain. The main thought running through it is, that as every individual needs a certain amount of land (some $\frac{1}{100}$ acre or so) this land should be given as curtilage to his house, and that he should not be squeezed into a tenement, flat, or residential mansion with some of his portion of land forming a portion of the distant area of catchment of his water supply, some part of that fouled by the city's sewage, and some—6 ft. × 2 ft.—in the neighbouring cemetery. Indeed, so strongly does the author write, that we suspect he would sympathise with the American woman who worked hard all her life, and finally said to her husband, "John, when I am dead, bury me in the garden, that I may help to shove up the potatoes."

A Treatise on Hygiene and Public Health. Edited by THOMAS STEVENSON, M.D., F.R.C.P. Lond.; Lecturer on Chemistry and Medical Jurisprudence at Guy's Hospital; and SHIRLEY F. MURPHY, Medical Officer of Health of the Administrative Council of London. Vol. I. London: J. & A. Churchill. 1892. 8vo. Pp. 1013.

THIS book on hygiene is the largest which has as yet been produced by English authors. Although only the first volume of the work, it contains more than 1,000 large pages. The typography and paper are excellent, and the illustrations are on a par with the rest of the book. The contributors are as follows:—Dr. S. Monckton Copeman, Dr. W. H. Corfield, Dr. T. W. Hime, Dr.

E. W. Hope, Surgeon H. G. Howse, Dr. Sidney H. C. Martin, Dr. J. Lane Notter, Dr. Louis C. Parkes, Dr. G. V. Poore, Mr. W. N. Shaw, F.R.S.; Mr. P. Gordon Smith, F.R.I.B.A.; Dr. T. Stevenson, Mr. G. J. Symons, F.R.S.; Surgeon F. Treves, Dr. W. H. White, Dr. C. T. Williams, and Mr. Keith D. Young, F.R.I.B.A.

The volume consists of monographs written by these well-selected authors on the following subjects—air, water, soil, disposal of refuse, inspection of meat, slaughter-houses, hospital hygiene, food, clothing, warming and ventilation, the dwelling, meteorology, offensive and noxious trades, baths, climate, and physical education.

The volume opens with an article on Air, the purely chemical part of which might be more extended. It embraces only 28 pages, or about one-fortieth of the contents of the volume. The statistics in reference to the mortality caused by unhealthy trades would be better discussed under the head of noxious businesses. Ozone is said to be composed of "3 molecules" of oxygen. It should be 3 atoms. We object to the term "compound molecule" used in reference to ozone, for all molecules of the gases are necessarily compounds. We also object to the statement that ammonia exists in the air in a free or uncombined state; it always exists there as a carbonate, nitrate, or other salt. Although much of the article is taken up with matters which pertain to ventilation rather than to air, we have good and clear directions given for the determination of carbonic acid in air, and the estimation of oxidisable organic matter. For the determination of other compounds, such as nitrous acid, no quantitative processes are given. We would have liked to see a little more space devoted to ozone, to which remarkable allotropic form of oxygen we believe the blue colour of the sky is due. On the nature and functions of this "scavenger of nature" much light has recently been shed.

The article on Warming and Ventilation by Mr. W. N. Shaw is one of the best in the work, and it is well illustrated. Although a free use of mathematics is made, yet the principles of ventilation are explained in a very simple and easily understood manner, and the information is thoroughly practical. In reference to gas stoves, we are told that, however convenient they may be, the heat derived from them costs eight times as much as that obtained from coal. The most economical gas stove or fireplace is that in

which the gas is concentrated upon as small a surface as possible, so as to raise the temperature of the asbestos, or whatever the solid material may be, to the highest possible temperature.

Quoting from Professor Carnelley's Report to the School Board of Dundee (Winter, Duncan, & Co., Dundee), the author informs us that in the heating of the public schools in Nottingham five times as much coal per head is consumed than in the Dundee schools. One open fire school in Dundee burns 23 lbs. of coal per head per annum, whilst one of the public schools in Leeds consumes 239 lbs. per head. These differences are not due to differences in systems of heating, for they exist no matter what methods are adopted. No explanation is afforded for these extraordinary differences. An interesting comparison is made in reference to the advantages and disadvantages of various systems of heating. As to first cost, stoves are most economical; next, open fireplaces; then hot pipes; and lastly, hot air ventilation. As to annual cost, pipes stand first; next, stoves, open fires, and, except in very large schools, mechanical ventilation. For proof of an equable distribution of heat and minima of draughts, the mechanical system exceeds all the others, and, if cost be not a barrier to its adoption, it ought to be in use not only in schools but in hospitals, reading rooms, theatres, &c.

Mr. Symons' article on Meteorology is, as might be expected, coming from such a source, in every respect up to date. The greater portion is taken up with a description and management of meteorological instruments. We should have liked a little more information on clouds, fogs, and atmospheric electricity. The article which follows Mr. Symons' deals with Climate in relation to health, is from the pen of Dr. C. Theodore Williams, and there are no repetitions in it of the statements made in the article on meteorology. In many of the other monographs we find exactly the same subjects treated, and not always concordantly, by two or more of the writers, but this is what might be expected in a work where different authors treat upon subjects which are correlated. On the whole, the article on climate is an excellent one though not of any great length. The author's style is clear, and he gives a large amount of interesting and useful information without using a superfluous word.

The article on Water is by Dr. Stevenson, the well-known toxicologist to the Home Office. It deals with the origin, storage, filtration, relative qualities, and analysis of this indispensable

liquid. The authorities quoted are the most recent and the most reliable. The question—Is hard water unwholesome? is fully discussed, with the result that it is declared to be wholesome if the hardness is temporary—*i.e.*, due to calcium carbonate, and not to the presence of earthy sulphates, chlorides, and nitrates. The merits of various kinds of filters are considered, and a preference given to the "Chamberland-Pasteur." This consists of unglazed porcelain, and acts mechanically. It is stated to be capable of preventing the passage of the pathogenic microbes. This filter is rather dear. We have a somewhat similar but cheaper one in the Birkenfeld filter, which is now coming into use. The relation of impure water to cholera, typhoid fever, and other diseases is, as might be expected, treated pretty fully.

The article on the Influence of Soil on Health is contributed by Dr. S. Monckton Copeman, Lecturer on Physiology at St. Thomas' Hospital. It begins by describing the effects produced on soils by micro-organisms. The various diseases which have been proved or suspected to be due to the influence of soils are detailed, with special reference to recent bacteriological researches.

Dr. Sidney Martin, of University College Hospital, deals with the subjects of Food and Diet. In enumerating the diseases transmitted to man through the medium of milk he makes no mention of typhoid fever. Dr. Hope's article on meat inspection follows Dr. Martin's on food, and to medical officers of health it is one of the most useful in the work.

Dr. Thomas W. Hime (a graduate of Dublin University), is the author of the article on Offensive Businesses, which describes most of the manufactures that are injurious to health. It abounds with useful information for the health officer. The chemistry of the article is, perhaps, a little rusty. White-lead is not $PbCO_3$, but a mixture of that body and PbO, OH_2. Two-thirds of the phosphorus and not one-half are distilled from the calcium metaphosphate used in the preparation of phosphorus. Chlorine is treated of in two places, and with some repetitions. Why not in one place only? The author, in speculating as to the way in which chloride causes death, does not seem to be aware that Sir C. A. Cameron, and later Professor Binz, have shown that the gas is taken into the circulation, that it may be detected in the brain, and that it is a neurotic poison.

The remaining articles in this work are all the products of the pens of authors thoroughly competent to deal with them; and the

division of labour in the production of this neat work has enabled each of the sections of it to be finished as by a master-hand.

We cordially recommend this book, not only to medical officers of health, but to all who take an interest in the great subject of public health.

The Cholera Epidemic of 1892 *in the Russian Empire: with Notes upon Treatment and Methods of Disinfection in Cholera, and a Short Account of the Conference on Cholera held in St. Petersburg in December*, 1892. By Frank Clemow, M.D. Edin., Member of the Epidemiological Society of London, &c. London and New York: Longmans, Green & Co. 1893. Pp. 123.

Russian experience of cholera is second only to Indian. Since 1823, when first the disease invaded Russian soil, there have been at least twenty-seven years in which it prevailed more or less widely in the country. In each of seven of these epidemics the mortality exceeded 100,000. In those seven years (1831 the first, 1892 the last), 3,754,104 cases were registered; with 1,508,282 deaths—a mortality of 40·18 per cent. In those seven epidemics the death-rate ranged from 36·4 per cent. in 1872 to 45·8 in 1892. In two only of these years, in 1831 and in 1848, did the numbers of cases and of deaths exceed those of 1892, the year to which Dr. Clemow's chapters are devoted. He has had access to all Russian sources of information on the subject, and his account of the epidemic is most satisfactory. The greater part of the work has already appeared in the columns of a contemporary.

In May, 1892, cholera appeared in Meshed, a Persian town about 65 miles from the Russo-Persian frontier. It entered Russia thence, and spread rapidly, finding congenial soil. From Russia it passed to Germany, Austro-Hungary, Belgium, Holland, and France. The unprecedented rapidity of its spread through Russia was a natural consequence of the improved railway communication, and the multiplication of travellers. In Asiatic Russia (exclusive of the Caucasus) 89,175 cases were reported, with 46,831 deaths (52·5 per cent.), from May to November. A table gives the statistics of the epidemic in the provinces of Central Asiatic Russia and of Siberia; on which the author makes the following remarks:—

"From these figures it will be noted that the intensity of the *cholera process*, indicated by the proportion of fatal cases, has borne no constant

relation to the intensity of the *epidemic*, as shown by the proportion of population attacked by the disease. Thus, in Transcaspia, where out of every 100,000 inhabitants 400 suffered from cholera, 54 per cent. of the cases proved fatal; whilst in Tobolsk, where, out of the same number of inhabitants, 1,865 persons, or nearly five times as many as in Transcaspia, suffered from the disease, only 48·4 per cent. of the cases succumbed. The extraordinary high death-rate of 70·5 in the Syr Daria province cannot but raise the suspicion that many cases that recovered have not been reported from this district."

There is one predisposing cause which especially favours the wide and rapid spread of cholera in Russia: the prevalence and severity of gastro-intestinal catarrh. No other disease produces in ordinary times so high a total of mortality. In six large towns, representative in position of all parts of the Empire, in three years (1887–9), 41,649 deaths were due to this affection: diseases of the respiratory organs destroying only 31,821, and tuberculosis 27,916 lives. This extraordinary prevalence of gastro-intestinal catarrh is attributable to the food which the Russian peasant eats and the fluids which he drinks. His rye-bread is black, acid, and irritant. "Soup made of fermented cabbage, dried fish, meat in no great quantity, salted herring, raw cucumbers and melons, with *vodka* and *kvass* complete the diet."[a] Ten samples of *kvass* from St. Petersburg public-houses were examined by the official analyst, when cholera broke out in the city, and all were reported unfit for human use. "In the sediment found in each bottle was discovered a mass of lower organisms, infusoria, dust, fragments of rag and small stones. One sample was found to swarm with the 'flour-tick' (*acarus farinæ*). In some of the samples were found small shot which had been used for cleaning the bottles. If such be the condition of the *kvass* consumed in the capital, it is scarcely likely that that drunk in the villages is better." Water-drinkers fare little better than those who delight in *kvass*. From several instances given by Dr. Clemow of the connection of bad water-supply with gastro-intestinal catarrh and cholera, we select Astrakhan, for example, here:—

"The water-supply is worse, gastro-intestinal catarrh is (with a single exception) more prevalent, and the cholera epidemic was more severe . . . . than in any other town in Russia . . . . The water distributed to the inhabitants of Astrakhan contains in solution 17·3

[a] Vodka is a rye-spirit. Kvass (frequently adulterated) is made from fermented black bread.

parts of organic matter in 100,000, more than four times the highest limit compatible with fitness for use. If, further, the suspended matters be taken into account, the water is found to be seven times more polluted than the worst potable water. It is passed through filter-beds, but actually becomes fouler in the process than it was before, and the inhabitants frequently refuse to use the water from the water-works, preferring to take their supply direct from the river or from springs. Of the total annual deaths in Astrakhan one-third, and sometimes more, are due to gastro-intestinal catarrh. This proportion is only exceeded in the town of Saratof. Finally, the absolute and relative numbers of cases and deaths from cholera were higher in Astrakhan than in any other town in Russia. Amongst a population of only 95,000 there were recorded 4,798 cases and 3,160 deaths. The case-rate was thus 5,050 and the death-rate 3,326 per 100,000 inhabitants. The per-centage of deaths to cases was 65·86—that is to say, very nearly two-thirds of the cases proved fatal."

In connection with predisposing causes it is not a little remarkable that the districts which suffered most from famine in 1891, do not seem to have been the most severely visited with cholera in 1892. This was, at least, the opinion of the majority of the speakers at the Cholera Conference assembled in St. Petersburg last December. In some districts, where the famine was most severe, typhus, typhoid and scurvy followed; but cholera proved even less fatal than elsewhere. Dr. Clemow concludes "that the weakened condition of the peasants in the famine-stricken governments did not predispose them to contract cholera;" and he suggests the generalisation that "the pre-existing state of health of a given population is a factor of little if any importance in affecting the spread or fatality of a cholera epidemic." He cites the case of 1832–3 as a parallel:—

"In the years 1832 and 1833 the southern and central governments of European Russia were visited by a famine that had never been equalled before, nor has it since, in the fearful distress which it caused amongst the peasantry. Starvation and its attendant ills, scurvy and fevers, typhus and typhoid, carried off the population by tens and even by hundreds of thousands. On June 15th, 1833, cholera appeared in the government of Voronezh, and spread thence to twenty-four other governments; and yet, though the epidemic was widely spread over the area that was suffering from famine, it at no time, and in no part of this area, attained any great intensity. Only five governments were at all severely visited by cholera, and in none of them did the number of deaths recorded rise as high as 100 per 100,000 inhabitants. In the whole course of this

epidemic there were reported only 14,428 cases and 5,330 deaths. The proportion of deaths to cases was thus rather less than 37 per cent."

It cannot be doubted, however, that famine and its attendant diseases had cleared off some thousands who would have died of cholera if they had lived long enough.

We commend Dr. Clemow's seventh chapter, on the Method of Spread of Cholera, to those physicians, if any such there be, who doubt that cholera spreads along the lines of human communication; the dissemination being more rapid when the course is along a great river, like the Volga, than by railway lines. "The evidence is indeed overwhelming that cholera does not originate *de novo*, but that every case of the disease is the result, directly or indirectly, of some pre-existing case."

A word, in conclusion, as to quarantine. "The principle and practice were condemned unanimously, and in no halting terms," by the St. Petersburg Conference.

"The Report declares that quarantine has no scientific basis, that it leads to great annoyance and loss, that it demands an immense expenditure for its proper carrying out, and that it does not attain its end, as evasion of quarantine is always possible. The report, therefore, recommends that quarantine should be replaced by a system of inspection, isolation of sick, and disinfection."

Report of a Committee appointed by the Clinical Society of London to investigate the periods of Incubation and Contagiousness of certain Infectious Diseases. Supplement to Volume the Twenty-fifth. London: Longmans, Green, & Co. 1892. 8vo. Pp. ix–225.

In the introduction to this valuable Report we are reminded that in 1878 the Clinical Society of London appointed a Committee to investigate the periods of incubation and contagiousness of small-pox, scarlet fever, typhus fever, diphtheria, enteric fever, erysipelas, varicella, mumps, and other communicable diseases. In November, 1888, this Committee was reconstituted, and a circular letter was sent to a number of medical practitioners in the most sparsely-populated parts of the country, who, in view of their remoteness from large centres of population, might have peculiarly favourable opportunities of tracing the source and progress of infection.

The letter, which was also published in the medical journals, asked for particulars of cases likely to throw light on the periods of incubation or of contagiousness of the zymotic diseases commonly observed in the United Kingdom. Many replies to this letter were received. Sir George Buchanan also allowed his complete collection of Reports made to the Medical Department of the Local Government Board since 1878 to be examined. The material thus obtained was arranged, condensed, and tabulated in the Report before us, which was prepared for publication by Dr. Dawson Williams, one of the Honorary Secretaries of the Committee. The members of the Committee, as constituted in 1888, were—Sir William H. Broadbent, Bart., M.D., Chairman; Sir George Buchanan, K.C.B.; Drs. Cayley, Barlow, Alfred Hill, Isambard Owen, R. Thorne Thorne, C.B.; Alder Smith, and R. W. Parker, with Mr. Shirley F. Murphy and Dr. Dawson Williams as Honorary Secretaries.

The diseases upon which the Committee report are—small-pox, varicella, measles, rubeola (that is, Rötheln), scarlet fever, influenza, whooping-cough, diphtheria, enteric fever, mumps. A separate section is devoted to each disease, the sections being arranged in alphabetical sequence for convenience of reference.

The term "period of incubation" has been taken in its ordinary sense throughout the Report to mean the interval between exposure to a source of infection and the development of the earliest recognisable symptoms. The Committee observe that in certain cases—in diphtheria, for instance, and perhaps in measles—there is some evidence that continuous—*i.e.*, prolonged—exposure to a source of infection appears to shorten the period of incubation.

In accordance with a suggestion made by Dr. Donald Macalister (*Practitioner*, Vol. XLIII., page 123), which we cannot approve, the adjective "diphtherial" has been systematically used to express the specific process due to the disease diphtheria, the term "diphtheritic" being used for other inflammatory processes not due to true diphtheria. Surely it is a contradiction in terms to call such processes "diphtheritic," it being conceded that they are not such in any sense.

To give an idea of the scope of the work we will quote the "Conclusions" about the very disease in question—namely, diphtheria. The Committee say that the incubation period does not, as a rule, exceed four days, and is more often two days than any other period. Not infrequently it extends to five, six, or seven

days, but it is doubtful whether it ever exceeds the last-named period.

A person may be infected by a patient suffering from diphtheria (*a*) in the incubative stage; (*b*) during the developed attack; (*c*) for a period of long but uncertain and probably varying duration after apparent recovery. In such cases of late infection some unhealthy condition of throat will, as a rule at least, be found to have persisted, or, possibly, to have recurred.

The infection of diphtheria can be retained in clothes, carpets, and other fomites for months—perhaps years. It may be derived from cases so mild that the patient never comes under medical treatment, or presents symptoms so little characteristic that their true nature is not recognised even after medical examination.

One of the least satisfactory sections in the Report is that devoted to "Rubeola"—a synonym for epidemic rose-rash, or Rötheln, which has been chosen with singular infelicity, and with too great deference to the German school. The term "rubeola" will certainly lead to confusion between the disease meant and true measles, which in former days was extensively known by this name, and the following paragraph is so extremely vague as to excite suspicion of inaccurate observation:—"The incubation period of rubeola is, *as a rule to which there are many exceptions*" (the italics are ours), "some period more than two and less than three weeks. Eighteen days is, probably, the usual period. In a considerable number of cases it is a day or two less than two weeks, in a few it is only eight or nine days, and it is possible that in a small number it may be as short as six or five."

The sections on measles, scarlet fever and small-pox are particularly full and instructive. Under the last heading, Mr. Frank Colclough has contributed an interesting note founded upon the experience of the small-pox hospital ships of the Metropolitan Asylum Board from the time Dr. Birdwood became Medical Superintendent. It would appear from this statement that a very large proportion of persons vaccinated or re-vaccinated successfully at or shortly before the commencement of exposure to infection, escape infection entirely. In some instances, however, on or about the twelfth day the individual suffers from an attack of illness characterised by headache, pyrexia, and other symptoms of fever, and accompanied sometimes by an erythematous rash. Recovery occurs in two or three days. This illness, which is manifestly a *variola sine variolis*, is of sufficiently common occurrence to have

come to be recognised by the staff as a kind of "acclimatisation fever." In other cases, again, in addition to headache and malaise, with or without pyrexia, a few abortive papules appear. Such cases are capable of conveying the infection to susceptible persons. Finally, in a small minority of cases a definite attack of modified discrete small-pox occurs.

When vaccination or re-vaccination fails to prevent infection entirely, it does not appear to have any effect in altering the period of incubation.

For much interesting and novel information we must refer our readers to this Report itself, and in doing so we would add our tribute of praise for the able way in which Dr. Dawson Williams has prepared the Report for publication.

The Health Resorts of the Canary Islands in their Climatological and Medical Aspects. By J. CLEASBY TAYLOR, M.D. Edin., M.R.C.S. Lond., con titulo Español Las Palmas. London: J. & A. Churchill. 1893. 8vo. Pp. 95.

WRITTEN in the first instance as a thesis for the degree of Doctor of Medicine in the Medical Faculty of the University of Edinburgh, Dr. Cleasby Taylor's very instructive and entertaining book comes before us with the *imprimatur* of that great seat of learning. This fact disarms hostile criticism, supposing such were contemplated by the reviewer.

On Tuesday, the 1st of August, in this year, we had the good fortune to be present at the ceremony of "Capping" in the University of Edinburgh, when a gold medal was awarded to Dr. Taylor as a prize for the work which now lies before us. We have since then read the book with care, and are in a position accordingly to endorse the favourable verdict of his Alma Mater on the merits of Dr. Taylor's latest contribution to the climatology and history of the "Fortunate Islands."

The book is well arranged. It consists of eight "Sections" and an ethnological appendix on the Guanche race—its manners and customs, its craniological and skeletal peculiarities. This name Guanche was originally used only for the aboriginal inhabitants of Teneriffe, but is now applied to the original inhabitants of the whole group of islands known to the Greeks as *αἱ τῶν μακάρων νῆσοι* (the Islands of the Blessed), to the Latins as the Insulæ Fortunatæ.

In a brief history of what are now called the Canary Islands (*Lat.* canaria, belonging to dogs) Dr. Taylor recalls the fact that the wine made from the vineyards of Gran Canaria was in great request in the olden time. Thus Shakespeare puts into the mouth of the host of the Garter Inn the words, "Farewell, my hearts; I will to my honest Knight Falstaff, and drink canary with him." A more modern industry, which in its turn is dying out, owing to the introduction into commerce of aniline dyes, was the cultivation of the cochineal insect (*Coccus cacti*). In 1826, it was found that this insect throve on the *Cactus opuntia*, a plant which flourished on the islands. From 1830 to 1869 this industry brought prosperity to the inhabitants, who, since 1884, have had to depend chiefly on the exportation of bananas, tomatoes, potatoes, oranges, &c., and on the opening up of the islands as health resorts. All this has been rendered possible by the development of the principal ports of Grand Canary and Teneriffe into coaling stations for ocean-going steamers.

A short section (II.) on the geographical and physical features of the islands, and their relation to the climate, is followed by a very full account of the meteorology of the group.

Section IV. describes the localities suitable for health resorts and their distinctive characteristics, especially in respect to accessibility by land or sea, accommodation, and altitude. It is quite startling to read that at the present time nearly 250 steamers call every month at Las Palmas in Grand Canary and at Santa Cruz de Tenerife. These steamers are bound for all parts of the world from ports of the United Kingdom, Germany, Spain, and Italy.

In Section V., Dr. Taylor considers the climate of the islands in relation to health and to disease, the various localities and their relation to disease, and the future of the islands as health resorts. In Section VI., on the Public Health of the islands, information is given as to the birth-rate and death-rate (general and phthisical), drainage, and water-supply.

Section VII. is devoted to the natural mineral waters, of which there are several in the Canary Islands, the chief being—Zabinosa, in the island of Hierro; Charco Verde, in La Palma; Santa Catalina, in the island of Grand Canary—in all of which chloride of sodium is the principal constituent; Firgas (*Agua Agria*, an earthy or calcareous water), and Agaete (*Agua d'Agaete*, a chalybeate water, containing iron in the form of ferrous carbonate, 10 grains to the gallon, with carbonates of lime and magnesium).

Section VIII. gives a comparison with other health resorts by means of meteorological data.

The book ends with a useful list of works consulted by the author.

We can heartily recommend Dr. Taylor's "Health Resorts of the Canary Islands" both to the medical profession and to the lay public in search of a mild and equable winter climate.

Auscultation and Percussion: together with the other Methods of Physical Examination of the Chest. By SAMUEL GEE, M.D., F.R.C.P.; Physician to St. Bartholomew's Hospital. Fourth Edition. London: Smith, Elder & Co. 1893. 8vo. Pp. 327.

TEN years have elapsed since the third edition of Dr. Gee's well-known "Auscultation and Percussion" was published. The present issue differs but little from its predecessor, but a comparison of the two books shows that the author has not been idle during the past decade. Every page bears traces of careful revision and judicious pruning. Many footnotes with references to classical medical works have disappeared. The result is that the work now runs to only 327 pages, against 344 in the third edition.

Dr. Gee has apparently returned to his classical studies as the years roll by, for not only is there an apt Latin quotation at the end of several chapters, but the author has even invoked the aid of the Muse in dedicating his book to the memory of Laennec, which he does in the following neatly-turned hexameter lines:—

"E TENEBRIS TANTIS TAM CLARVM EXTOLLERE LVMEN
QVI PRIMVS POTVISTI ILLVSTRANS PECTORIS ANTRVM
TE SEQVOR O GALLÆ GENTIS DECVS INQVE TVIS NVNC
FIXA PEDVM PONO PRESSIS VESTIGIA SIGNIS
NON ITA CERTANDI CVPIDVS QVAM PROPTER AMOREM
QVOD TE IMITARI AVEO."

There is no preface to this edition, but at the end of the book Dr. Gee appends this sensible "Note":—

"In the foregoing pages I have taken great pains with the terminology; and I have used technical words with strict adherence to their original meaning. I have not taken upon myself to pervert the meaning of words already well defined, nor have I invented new words to denote signs already well denominated. Much of the difficulty of teaching

auscultation and percussion to students is due to neglect of these plain rules which everyone who uses technical terms may be expected to follow, or to give good reasons for not following."

In his pages Dr. Gee is as good as his word, for at page 123 he says—"Rale, rhonchus, rattle; these words are synonymous. . . . Rales are of three kinds: crepitant, mucous, and sonorosibilant." Needless to say that this is not at all the terminology or classification of sounds which was adopted by the Ninth International Medical Congress at Copenhagen in 1884. However, Dr. Gee's conservatism is attractive; and we are of the same opinion now as in 1883 that this text-book of physical examination of the chest is one of the best of its class which has ever issued from the press.

Introduction to the Catalogue of the Collection of Calculi of the Bladder, upwards of one thousand in number (besides foreign bodies), removed by Operation. By Sir Henry Thompson, F.R.C.S., M.B., London; Surgeon Extraordinary to H. M. the King of the Belgians; Consulting Surgeon and Emeritus Professor of Clinical Surgery to University College Hospital, London; Member of the Société de Chirurgie de Paris, &c. This collection was presented in 1892 to the Hunterian Museum of the Royal College of Surgeons in London, where it is now deposited with copies of the Catalogue and introduction. London: J. & A. Churchill. 1893.

Sir Henry Thompson's brief introduction to the catalogue of his collection of vesical calculi, will be read with great interest by all who desire to know fully the present position of this branch of surgery, in which advances as great as those of any other department of surgery have been made in the last few years. With unrivalled opportunity for the study of the subject, Sir Henry Thompson gives, in thirty-nine short pages, a complete summary of all his own experience, sufficient to guide the surgeon in the selection of the method suitable to any particular case. He thus describes the quality of the information his introduction affords:—"Whatever I offer here may be accepted as the outcome of my entire work in this department of surgery. Not a single case has been omitted. My object has been to present here an accurate, although necessarily very brief study of the data obtained chiefly

in relation to treatment and its consequences. And here, let me be permitted to state respecting treatment at the outset, that I am not conscious of having entertained undue predeliction for any particular methods, and have therefore selected them, according to my judgment, for the requirements of each individual patient."

This is just such guidance as the practical surgeon who enjoys but few opportunities for acquiring experience of stone cases, likes to fall back on when called to treat a patient suffering from stone. The total number of patients contained in Sir Henry Thompson's list is 893, on whom were performed 1,013 operations, with a mortality of 99. In considering this summary, attention must be directed to the fact that in dealing with the most numerous group of cases, stone in the bladder of adult males, Sir Henry Thompson excludes from his list all in which the calculus weighs less than 20 grains, as he declines to name the treatment of particles of gravel of 1 or 2 grains in weight in "An Operation for Stone in the Bladder." Of these he says, "Had I included all these examples in my series of calculi, the total number would have reached at least 300 cases more than it now does." This exclusion of trivial cases makes the series of all the more value as a practical guide in treatment, while it removes the publication of our author from the suspicion of mere advertisement which hangs about the too familiar heading—"One hundred cases treated without a death."

A Handbook of Ophthalmic Science and Practice. By HENRY E. JULER, F.R.C.S. Second Edition. London: Smith, Elder & Co. 1893. Quarto. Pp. 549.

WE must congratulate Mr. Juler upon the second edition of his handbook, of which, he says, "considerable alterations and additions have been made both in the text and in the illustrations."

We gave so full a review of the first edition in 1884 that it is unnecessary to do more than notice one or two points in the present.

In the description (p. 27) of the blepharo-cheiloplastic operation, originally suggested by Van Millingen, no mention is made of the very important modifications introduced and practised at

St. Mark's Ophthalmic Hospital, Dublin, where the operation has been brought to such perfection.

He speaks also of the "shrinking of the mucous membrane immediately after separation from the lips." In our experience this shrinking is almost entirely absent, and very little, if any, allowance need be made for it. The whole account of the operation is most inadequate.

Again, in the treatment of stenosis of the nasal duct (p. 51), no mention is made of the method of using the styles intermittingly, the patient removing and reapplying them at intervals.

The book is nicely written, and has many good points, is well illustrated and well printed, but in some details, at least, not quite up to date. The author has, however, shown consideration for his many admirers, in supplying them, at page 436, with an excellent likeness of himself.

Wright's Improved Physicians', Surgeons', and Consultants' Visiting List. Compiled by ROBERT SIMPSON, L.R.C.P., L.R.C.S. 1894. Bristol: John Wright & Co. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited; Hirschfield Bros.

IT will be best to let this neat Visiting List—apparently the first published for the year 1894—tell its own story in the words of its "Preface":—

"The objects in view in issuing this Visiting List have been—1. To economise space and provide the greatest amount of accommodation; 2. To economise the Practitioner's time by enabling him to write his patients' names once a month only instead of weekly as heretofore; and 3. To include a Consultants' Record, in which consulting practitioners may see at a glance the date and hour of their appointment, together with the name of the medical man in attendance.

"These advantages have been gained within the covers of a leather bound, thin, soft, and comfortable pocket book, upon paper of good quality, without inordinately increasing the price, and within smaller dimensions than has been hitherto attempted."

The price list for 160 patients monthly is as follows:—With flexible leather flap cover, without tuck, post free, 5s. 6d.; with cloth sides flush, for fitting in leather wallet, post free, 5s.; sealskin wallet, strongly sewn, with four pockets and pencil, to contain cloth list, post free, 8s. 6d.

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PART III.

SPECIAL REPORTS.

A RETROSPECT OF OBSTETRIC AND GYNÆCOLOGICAL PRACTICE FOR TWELVE MONTHS.

By E. Hastings Tweedy, L.R.C.P.I., L.R.C.S.I.; Assistant Master Rotunda Hospital; Late House Surgeon, Steevens' Hospital, Dublin.

In reviewing the work done in the above subjects during the year we cannot but feel satisfied with the result. Thoughtful and unremitting attention has been expended on both branches, and we are confident that much of the work will bear permanent fruit.

The year has added confirmation to the belief that true asepticism cannot be obtained by mere cleanliness alone, but to achieve this end the free use of antiseptics is still necessary.

Much also has been done to place the different antiseptics in their proper spheres. It has been proved that boiling water (temp. 212° F.) is the ideal antiseptic for all instruments, and none but those capable of being so treated should ever now be used.

Corrosive sublimate (1 in 500) is still regarded as the most powerful and efficient disinfector of epidermic structures, and ought, therefore, to be used exclusively for the operator's hands, taking care, of course, to remove every particle of soap before immersion. On the other hand, its poisonous qualities, its instability when brought into contact with albuminous fluids and steel instruments, and the hardening of the skin which follows its application, have rendered its use obsolete as a uterine injection.

Jeyes' creolin (2 per cent. sol.) has appeared within the year to answer all the requirements of a safe and efficient intra-uterine antiseptic.

Lysol has come to be extensively employed, and its lubricating properties render it particularly serviceable, as by its use we can now dispense with greasy applications, none of which are found in practice to be free from risk.

The revival of symphysiotomy is undoubtedly the greatest advance which has been made in midwifery practice for some considerable time. Within the past twelve months it has been performed twice in the Rotunda Hospital, once in England, and several hundred times throughout the continents of Europe and America.

The excellent results obtained from this operation have effectually silenced any mere theoretical objections to its use.

The year's experience has almost conclusively proved it to be probably the safest of the major operations, comparatively easy in its execution, and free from the disadvantage of giving rise to a movable joint at the symphysis—an objection strongly urged against its employment a year ago. It will, undoubtedly, in the future be the operation employed in all cases of contracted pelvis where the deformity is not of an extreme degree (not below $2\frac{3}{4}$ inches in the conjugate, with a living fœtus in utero), and where there is no reason to believe that septic infection has been established. It is obvious that those conditions of ankylosis of the pelvic joints, as a Roberts' Naegele or coxalgic pelvis, must at all times prove a contra-indication to this operation.

Plugging the uterus with iodoform gauze in cases of alarming *post-partum* hæmorrhage, has become a recognised and very valuable method of dealing with this complication in spite of the theoretical objections urged against its use, especially in the London School.

The advantages claimed for it are safety, efficiency, and rapidity in its application.

In the collapse following serious flooding, a new departure has occurred in the method of transfusion. The intravenous injection of enormous quantities of a 2 per cent. saline solution (3 to 4 quarts) has been found a reliable means of restoring the blood pressure.

Every one who has had to deal with a case of interstitial mastitis, knows how very unsatisfactory the treatment of the disease was when it consisted in early incision, poulticing, drainage tube, and irrigation with antiseptic solutions. A new method which promises a cure in eight or ten days will therefore be hailed as a decided advance in our knowledge.

The method of procedure is as follows:—As soon as pus forms, the breast is incised and a finger inserted into the abscess cavity, the diseased structures surrounding it being broken down by the exercise of force. The cavity is then plugged with moist iodoform

gauze, and a pad and tight bandage applied. The packing is renewed on two successive days, after which an ordinary dressing suffices, the lips of the wound being brought together, and a tight bandage still being used as a support to the breast. The patient is convalescent on the seventh or eighth day.

Turning to the treatment of diseases peculiar to women, we notice the decline in a remarkable manner of the electrical treatment of fibroid tumours. On the other hand, gynæcologists have come to look on myomata as not the harmless tumours we were but a few years ago taught to regard them. Twelve months ago the burning question centred on the treatment of the stump in hysterectomy for myomata. The introduction, however, of total extirpation in cases heretofore treated by the extra- or intra-peritoneal method has proved so much superior to either operation that further discussion on this point is valueless.

The disadvantages of the latter operation—namely, greater difficulty of execution, prolonged anæsthesia, and severer shock to the nervous system—are found to be more than compensated for by the greater freedom from sepsis, pain, secondary hæmorrhage, and delayed convalescence. This operation has within the past few months been still further simplified by Professor Martin, of Berlin, who now removes the stump through the abdominal incision.

We cannot believe that Dr. Martin's operation for the resection of the Fallopian tubes will ever be of practical use. One has only to think of the narrow lumen of the tube, the tendency of all such dilated structures to contract, and the destruction of the ciliated epithelium which occurs in all tubal diseases, to be rendered sceptical as to the utility of this treatment.

On the other hand, the resection of the ovaries, as described and performed by Dr. Pozzi, of Paris, promises to be not only most interesting to scientific gynæcologists, but also of great practical value. By it we can remove the diseased part of the ovary, and yet leave the woman free from the stigma of barrenness. This operation will have its special field of usefulness in cases where the other ovary has become useless or been previously removed, and we feel confident that it will appeal to all gynæcologists as a great advance.

Yet another medical treatment for cancer of the uterus has been evolved—this time by Dr. Schmitz. His treatment consists of injection of alcohol into the affected part. Although we do not wish to bias our readers, we may state that we only believe in one

treatment for uterine cancer—total extirpation of the organ; at all events, we should be sorry to recommend this treatment in any but those cases where the disease had spread too extensively for surgical interference.

Dr. Sänger's operation for the repair of lacerated cervix overcomes the objection to Emmet's old operation—namely, narrowing of the cervical canal. It is easy in its accomplishment, and in every respect is as efficient as the American operation.

Dr. W. T. Lusk describes, in the July number of the *New York Journal of Obstetrics and Gynæcology*, a very interesting operation which he performed for ectopic gestation, the fœtus being alive and between the sixth and seventh month. Having cut down on the sac, he ligatured the ovarian arteries, and was thus able to remove the fœtus with its placenta and membranes attached, the hæmorrhage resulting therefrom being easily controlled by pressure on the aorta, and subsequent plugging with iodoform gauze.

Now that curetting has become so universally and rightly employed in the treatment of endometritis—the commonest disease from which women suffer—the experience of many operators had better once more be noted. That this is not always a harmless proceeding, and that it also requires some special skill in its accomplishment, is evident from the many unfavourable cases which from time to time come under our notice. The complications which have occurred with greatest frequency are—1st, hæmorrhage; 2nd, perforation of the diseased and softened uterus; and 3rd, acute sepsis.

ELECTROCUTION.

THE *Medical Record* of 5th August comments severely on the execution by electricity of a convict at Auburn (N.Y.) on the 21st July. It is impossible to conceal the fact that the new method proved, in this case, a ghastly failure, although the criminal was ultimately extinguished by electricity.

DOMINION MEDICAL MONTHLY.

WE have received the first number of this periodical, published at Toronto. It promises well. One very obvious reform it undertakes to advocate—the establishment of a central licensing board for the Dominion. At present each province has its own qualifying body or bodies, and admits graduates of other provinces to practice only after re-examination.

PART IV.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

Waterborne Cholera.[a] By ERNEST HART, D.C.L. Durh. (*hon. causa*); M.R.C.S. Eng.; Editor of the British Medical Journal; Chairman of the National Health Society.

(*Continued from page 322, and concluded.*)

(F) RUSSIAN EXPERIENCES IN 1892.

The complete history of the cholera epidemic in Russia in 1892 remains still to be written, but what we know of it bears out previous experiences as to the influence of infected water. We venture to take the following extract from some very interesting papers on the subject which have been written by Dr. Frank Clemow,[b] of St. Petersburg. Speaking of the distribution of the epidemic, Dr. Clemow says that "the experience of last year's epidemic has added a large body of evidence to that furnished by earlier outbreaks upon which conclusions may be founded as to the means by which cholera is spread from one district to another. In tracing the disease from its first introduction across the Persian frontier throughout the Russian empire, it has, I think, been clearly shown that cholera followed the main lines of human communication, and that where these lines coincided with a great river, such as the Volga, the spread of the disease was much more rapid than where communication was mainly by railways. These were the conclusions to be drawn from the behaviour of the epidemic as a whole. The object of the present article is to bring together evidence as to its behaviour in individual cases. The evidence has been collected from various sources, but principally from the discussions at the conference on cholera held in St. Petersburg last December, and from the medical and lay press at the time of the epidemic. In almost every instance that has been recorded where the means by which the infection was carried was known the course of events was somewhat as follows:—A person coming from an infected district to one that has

[a] An Address delivered before the Forty-fourth Annual Meeting of the American Medical Association, held at Milwaukee, Wis., June 7, 1893.

[b] Lancet, May, 1893. P. 1,055.

hitherto been free from the disease sickened with cholera soon after his arrival. The earliest subsequent cases in the town or village occurred among members of the household of the first patient, among persons who had been in contact with the first patient or with articles soiled by him, or among persons who had drunk water from sources polluted, directly or indirectly, by the dejecta of the first patient. I may be pardoned for giving in detail the following instructive histories:—In the village of Ulybyshef (Vladimir government) a labourer arrived on June 29 from Kazan, where he had attended the funeral of his brother, who had died from cholera. Three days later he sickened with the disease in the morning and died in the same evening. The clothes he had worn remained in an outbuilding for a week. They were then washed in the stream from which the village drew its water supply. In a very short time cholera became epidemic throughout the village. In the government of Viatka, five villages situated along the banks of the same stream were invaded by cholera. The infection was traced to the systematic washing of linen belonging to the early cases in the stream which provided the inhabitants of all the five villages with their drinking water. No sooner was this practice forbidden than the epidemic began to abate. In the village of Upper Moulla (Penn government) an exactly similar relation of cause and effect was recorded. The linen of cholera patients was washed in a pond. From the same pond the inhabitants drew their supply of drinking water, with the result that cholera raged throughout the village. As in the last instance, as soon as the washing of linen in the pond was put a stop to, the number of cases of cholera in the village began to diminish. In the village of Borki (Samara government), lying on the river Samarka, the first case of cholera was that of a woman. After a short interval a peasant was seized with cholera upon a barque lying at anchor a short distance further down the river. The disease then became epidemic solely among that portion of the population which drew its drinking water from the river. The remaining inhabitants, who drank water obtained from wells, remained free from the disease with but one or two exceptions. In Great Bereznikof, a village in the Simbirsk government, an exactly parallel instance was recorded. Cholera attacked only that part of the village which drew its water supply from the river Kshi, while among the inhabitants of the village whose drinking water was derived from wells there was but a single case—that of a beggar woman to whom had been given some clothes from an infected house. In two villages in the Tambof government, in each of which a dual water supply existed, it was observed in like manner that cholera was confined to one portion of the inhabitants. In each instance it was found that this portion of the inhabitants drew its water supply from a pond contaminated through the washing of linen of cholera patients. The rest of the village, supplied with well water not so contaminated, did not furnish a single

case of cholera. The part played by water in the diffusion of cholera was clearly illustrated at the beginning of the epidemic in St. Petersburg. It was found that the earliest cases were confined to the workmen in the large factories situated on the banks of that branch of the Neva known as the Great Nevka. The workmen were accustomed to drink water derived directly, without filtration or boiling, from this branch of the river—water which at all times is charged with much organic matter (14 parts in 100,000), and which produces gastro-intestinal catarrh in all persons unaccustomed to its use. It was at once arranged that water should be supplied to the workmen from the town waterworks, and that this water should be filtered or boiled before drinking. The effect of the change in the water supply was immediate, and there was no further spread of cholera in that part of the city. Another instructive case was furnished by one of the St. Petersburg prisons. A prisoner who had been in solitary confinement for more than a month was suddenly seized with all the symptoms of cholera. Bacteriological and *post-mortem* evidence confirmed the diagnosis. All the prisoners were supplied with boiled water, and for a time the source of infection remained an enigma, which was only solved by the discovery that the deceased had drunk a quantity of unboiled water, provided to him for washing purposes. Steps were immediately taken to furnish all the other prisoners with boiled water for whatever purpose required."

In an interesting Report by the United States Consul at Tashkent, in Turkestan, dated October 11, 1892, I also find the following interesting statements:—

"That the cholera germs were taken into the system through drinking impure water my experience and personal observation confirm. At Samarcand three regiments of infantry were encamped side by side on a level plain close beside a stream of water. The colonel of one of these regiments took the most extraordinary pains to prevent his men from being attacked with the cholera, and he succeeded. In the first place he caused every article in the camp to be thoroughly cleansed with hot water and disinfected. He compelled his men to bathe every day in water that had been boiled, and a guard was constantly maintained whose duty it was to keep the soldiers from drinking the river water, and to carry out the colonel's instructions. The result was that not a single case of cholera occurred in the regiment, while the other two regiments which were camped alongside lost over 100 men from cholera. In these latter regiments the ordinary precautions were taken, but no such measures were adopted as I have mentioned above.

"At Ashabad the cholera had almost disappeared early in August, and the event was celebrated with much rejoicing on the Emperor's name day, which occurs in that month. The Governor-General gave a dinner, to which he invited a numerous company, and to the various regiments

were granted extra rations that they might rejoice on the occasion. The day which began so auspiciously amidst general rejoicing was destined to have an ending which has no parallel in history. Of the numerous guests who attended that dinner, one-half died within 24 hours. A military band of about 50 men, who played during that fatal dinner, lost 40 of their number with cholera and only 10 of the men reached camp that night. One regiment lost half its men and 9 officers ere the sun rose the following morning, and within 48 hours 1,300 died of cholera. The cause of this outbreak was clearly traced to a small stream of water which supplied the town. Four days previously the authorities were informed that cholera had broken out in a small Turcoman village, situated on the banks of this stream, about 4 miles from Ashabad. The inhabitants of this village were ordered to move their kilrtkas (tents) several miles back on the hills, which they did. On the day previous to the re-appearance of the cholera at Ashabad, a very heavy rain-storm occurred, which washed the banks of the river, and swept refuse and other matter from the abandoned village into the stream, and this matter was carried by the water into the city and distributed to all parts of the town by the numerous open canals through which the inhabitants were supplied with water. It was this contaminated water which caused the re-appearance of the epidemic and the frightful mortality which followed. The population of Ashabad was not more than 13,000, of which 10 per cent. died within 48 hours."

(G) CHOLERA AT HAMBURG IN 1892.

The secrecy and prevarication attempted last year at Hamburg, when cholera appeared in that city, are much to be regretted. Great risk was thereby incurred in other seaports where, had the presence of the disease in Hamburg been known, the exercise of a little extra vigilance, but without the imposition of quarantine, would have probably secured the detection before landing of any suspicious cases from the North German town. Although August 21 was the first day on which the presence of cholera in Hamburg was officially admitted, there is no doubt that cases had occurred there quite a week before that date. The public announcement that on the first day as many as 83 cases and 22 deaths had occurred naturally caused a feeling of much anxiety throughout Europe and America, for in times past Hamburg has been a very frequent distributor of the disease. How the infection was first introduced last year into Hamburg is still a matter of dispute, but there can be little disagreement with the opinion that when once it was started the public water supply was the vehicle of its dissemination.

The strongest and most striking evidence of this is afforded by the relative incidence of the disease on Hamburg, Altona and Wandsbeck, which together make up the Greater Hamburg. Wandsbeck, with a

population of 20,571, had 64 cases (3·1 per mille) and 43 deaths (2·0 per mille); Altona, with 173,279 inhabitants, had 572 cases (3·3), with 329 deaths (2·3); Hamburg State, with a population of 622,530, had 17,974 cases (28·8) and 7,611 deaths (12·2); or, taking only the infected parts, the town and suburbs of Hamburg, among 579,907 inhabitants there were 17,891 cases (30·8) and 7,582 deaths (13). This striking difference between Wandsbeck, Altona and Hamburg is distinctly traceable to the water supply. Thus Wandsbeck, which suffered less than the other two, is supplied with spring water, whereas Altona and Hamburg derive their water from the Elbe. Altona, however, gets its water very far down, at Blankenese, where the river is cleaner than in Hamburg, and passes it through a good gravel filter, unlike Hamburg, which gets its water from the harbour contaminated with sewage and absolutely unfiltered. These facts led Dr. Hueppe,[a] who spent the whole of last September in Hamburg, as well as most other observers, to the inevitable conclusion that the water of the harbour and the waterworks were answerable for the outbreak and rapid spread of the epidemic.

On behalf of the *British Medical Journal*, the history of the water supply of Hamburg has been investigated by a special commissioner on the spot, and its history has been examined from a series of official and other publications.[b]

HISTORY OF THE PRESENT SYSTEM.

According to the official volume, "Hamburg and its Buildings," published by the Hamburg Architects' and Engineers' Association in 1891, the oldest system of water supply, which was established in the fourteenth, sixteenth, and seventeenth centuries, was replaced in 1822 and 1843 by new systems, where steam power was first used. They were only in force in part of the town, but are not entirely out of use in certain districts at the present time.

After the great fire in 1842 W. Lindley undertook the water supply of the entire town, after Mylne's system, then in force in London; by 1849 the new supply was in full working order. In July, 1890, the sand filtration system of the water pumped from the Elbe was established at the central depot of the waterworks at the expense of 7,000,000 marks, and it now supplies districts including a population of nearly 800,000 souls. There are 64 fountains in Hamburg city, 39 being for drinking purposes; but, of course, the ornamental fountains and "market fountains," so familiar in Germany for public laundry work, play out water accessible for persons who may be more thirsty than prudent, and more thrifty than foreseeing. There remains the supply to private and public houses and offices. The Altona waterworks at Blankenese supply a

[a] Berlin. klin. Woch. Nos. 4 and 5, 1893.

[b] British Medical Journal. September 22, 1892, p. 708.

population of 140,000. They were originally built after the plan of Hawksley of London, in 1857, and nearly half of the present buildings remain as he projected them, but improvements were made on a large scale in 1873–75, and 1884–88. Extensive sand filtering beds were then constructed. It was on the recommendation of Herr Henry Gill, Director of the Berlin waterworks, and Augustus Fölsch, that sand filtration was introduced at Hamburg.

THE NEW SYSTEM.

Herr Arnold Samuelson, engineer to the Hamburg works, has published a treatise on the establishment and working of the new system in his city. The later treatises, pamphlets, and articles on this filtration, published this year, are, as might be expected, less congratulatory than those issued at an earlier date Herr Samuelson implies that the results are not satisfactory, while in a work on the lighting, drainage, and water supply of Hamburg, published in 1887, it is stated, at the conclusion of the paragraphs on the drainage and sand filtration, that the Elbe water purified by this system is remarkably good, especially pleasant and wholesome to drink, and at the same time well suited for ablution and laundry work, owing to the small quantity of calcium salts which it contains. The system is doubtless good, the filter beds have been excavated and paved with care. But not only may the water be polluted between the filter beds and the public fountains and private cisterns, as evidently occurs; not only do a large waterside population drink water direct from the Elbe, but there remains the fact, which long descriptions of new designs of filter beds must not make us forget, that a considerable district is yet supplied by a system seventy years old. Evidence is also not wanting that the water fresh from the filter beds is not free from germs; indeed, it appears to be infested with them.

THE ELBE WATER AND SAND FILTRATION.

This turns our attention to another fact—that the supply of water is from the Elbe. It is quite possible to filter away solid bodies, and to precipitate noxious inorganic chemical salts; but organic germs can not be removed by retaining millions of cubic feet of water from one of the great muddy Continental rivers in extensive open filtering beds. A few pints of water are easily purified, perhaps without boiling, in the wards of a hospital, but none would willingly rely on sand filtration alone for purifying water from a river which has run for hundreds of miles through hundreds of towns and villages. At least such filtration would never be trusted had an epidemic once broken out in the neighbourhood of a hospital. When it comes to the purity of the water supplying a great city, the insufficiency of sand filtration of river water is thus rendered self-evident.

Among the rules issued for the public benefit by the Imperial Sanitary Board we find clauses relating not only to ditch water, river water, and water from the basins of town pumps and fountains, but also to "suspicious water" from any source. The citizen is warned not to drink any water that may in his own opinion be suspicious, and he is also reminded that small house filters are untrustworthy, not being perfect purifiers of water which may be impure when put into the filter—the Hamburg water being no doubt borne in mind when this caution was framed—besides being specially dangerous when not kept perfectly clean by frequent changing.

THE PAST OF THE WATER.

Judging from official and medical works on Hamburg, that city has suffered very severely in the fourteen epidemics of cholera which, beginning in 1831, have hitherto visited that city until the last appearance of the disease in 1873. In all these publications the water is blamed; but it is the Elbe water fresh from the river that is meant even when not specified. In all the visitations the waterside poor were first attacked, and this truth, confirmed by statistics, is only what might have been expected. But an elaborate work on Hamburg, its natural history and medical aspect, lays all the blame on unfiltered Elbe water, and those who drink it; and this work appeared in 1876—that is to say, three years after the last epidemic. The explanation therein given as to the way in which the disease spreads to the wealthy, and to parts of Hamburg far from the Elbe and Alster, is clearly a hypothesis on which the authorities have been lulled into a false security.

The epidemic of 1892 shows that something has been overlooked. The first to suffer, says the work above quoted, are the sailors and poor close to the Elbe; then, when a large number of them are dead or ill, the infection is carried from man to man into other parts of the town. Thus direct contagion is made to account entirely for the spread of the disease. There is not a suggestion that the waters from the filters might be incompletely purified, although it is clear from close examination that in 1876, as now, the apparatus for filtration was not adequate, was not placed at the general disposal of the town, and besides did not promise such adequate filtration from organic impurity as its projectors professed it could give.

TRIBUTARY STREAMS AND LOCAL SUPPLIES.

Besides the "water supply" in the official sense of the term, we may consider the total supply of water procurable in any way, whether from Nature direct or from local sources. Dr. Wibel wrote an exhaustive monograph on the river and surface water of Hamburg in 1876. The three rivers in the immediate vicinity of the city are the Elbe, Bille and Alster. The analysis of water taken from the middle of the Elbe showed

that Elbe water was not different in composition from that of any other river similar in it source, length and course. The tourist who has visited the beautiful district near Dresden known as the Saxon Switzerland, is aware that the Elbe, as it flows by Schandau and Pirna, far from the great city near its mouth, is already a very dirty river; and even at Leitmeritz in Bohemia, the narrow rapid "Elbestrom" is as muddy as the Mississippi. Nobody would care to drink it there. At Hamburg it is, of course, much worse. The Bille is a small stream which flows from the woods where once our Saxon ancestors dwelt. Dr. Wibel shows that in the suburbs of Hamburg it is fairly pure. But near its entry into the Elbe within the city, it is thoroughly polluted, and full of all sorts of organic substances. The Alster arises in Holstein, and enters the Elbe after dilating, on account of artificial impediments, into the famous "outer and inner Alster," which are among the "lions" of Hamburg, and give a characteristic appearance to the city. The analytical tables show that the Alster is not nearly so polluted as the other rivers; probably its two great ponds, used for boating and skating, are not so near low quarters, and housewives with pails and dust-bin produce as are the Elbe and Bille. Unfortunately there flows into the outer Alster a stream of notorious ill fame—the Eilbeck—which neutralises much of the advantage that the Alster may gain from the kind of protection above referred to. The Eilbeck flows through the town of Wandsbeck, in Holstein, and before opening into the Alster it spreads out as a pond known as the Kuhmühlenteich. The Eilbeck was tried and found guilty in 1874 of having caused an epidemic of typhoid in a district through which it flows.

CANALISATION AND POLLUTION.—SURFACE WELLS AND PUMPS.—POSSIBILITY OF ARTESIAN WELLS.

Hamburg once had the great advantage of a large number of running streams of pure drinkable water. Hence, no doubt, in past centuries, when the hygiene of the town was otherwise far worse than at present, the citizens escaped dangers to which their living descendants are now exposed. The extensive canalisation of Hamburg has entirely destroyed many of these streams. Only four remain, and three are thoroughly polluted, running through dirty slums; one of them receives the drainage of the main cemetery. The fourth, the "Englischer Brunner," is less noxious. This pollution of bright streams is a sad affair, and their restitution to their pristine purity a theme worthy of the consideration of sanitarians. Dr. Wibel notes that the ease with which water can be obtained from the waterworks supply has caused the good old fashion of drawing water from these streams outside the town to die out. Our surprise about the prevalence of cholera will be much allayed when we find that Dr. Wibel analysed the brook water from certain pumps close to the streams. Out of the pumps much evil must be drawn. The

pumps properly so-called, drawing surface water and not water from the rivers or streams, are next considered. Their water is condemned, and yet some of them are specially used for table purposes. A few surface water ponds with drains exist in the neighbourhood of the city; of course, they are polluted. Lastly, Dr. Wibel describes his researches respecting the artesian wells, of which it appears there are ten at the disposal of the city. The water is fairly pure, but as it flows in different wells through different strata it varies greatly in chemical composition. In some cases it is highly charged with soluble inorganic salts. It is not satisfactory to find that Dr. Wibel does not consider that it is an easy matter to discover fresh artesian wells. There is no known indication for calculating where they can be pierced so as to reach water at a safe depth without great cost and difficulty.

ARTESIAN WELLS AND SAND FILTERS.

The mention of artesian wells in relation to Hamburg renders it necessary that all who take a real interest in the restitution of that city to a sanitary condition should remember precisely what an artesian well is, and how it is made. It is a spring of water, rising above the surface of the ground by natural hydrostatic pressure as the result of boring a small hole down through a series of strata to a water-carrying bed enclosed between two impervious layers. In the first place the difficulty of boing a small hole through a great depth of strata varying in density is considerable, and the expense high. The boring is always more or less experimental; the precise position of subterranean water is not always to be determined. Sometimes the boring need be but about 300 feet, as in many English wells; at others 3,000 or even 4,000 feet are exceeded. Then the boring may strike water lying between two impermeable strata; but there may be a flaw in one of the strata, or the lower may be damaged by boring too far. In both cases the water will not rise, as it escapes through the flaw or sinks below the lower impermeable stratum running through the boring into the porous soil beneath. In boring a well at St. Louis, Mo., in 1868, water was found at the depth of 3,147 feet, but it proved to be brine. Hence, minute precautions must be taken else all the engineer's labour may be in vain. Boring too many wells close together prevents the water from rising to the surface, so that pumps have to be used. To cry out for artesian wells at once is like demanding the instant building and equipment of ironclads when the foe is near the coast. The boring of the wells is a necessary prophylactic duty, which the authorities must deliberately, but not hurriedly undertake. As for shallow wells, digging for them is out of the question, as they are never to be tolerated in a porous soil, as at Hamburg, on which houses are built. The best bricking in of the sides cannot protect them from impurities entering from above and below.

For understanding sand filter beds much knowledge of sanitary engineering is demanded. But in relation to their failure at Hamburg, it is interesting to know how they may fail. In the filter beds the bottom is paved, then layers of clean material are spread, decreasing in coarseness from small rubble to sharp sand, with a total average thickness of about four feet. The actual filtration is effected by the upper layer of sand, and the lower layers allow the passage of the water unaccompanied by the sand. The efficiency of the filtration depends upon the slowness of the passage of the water; sometimes defects may cause the water to flow too fast. The top layer of sand soon becomes choked with the matter removed from the water. Hence the filter must periodically be cleaned by scraping off the top surface of the sand. Thus it is easy to understand that a filter bed may be faulty and is easily mismanaged.

During the months which immediately followed the epidemic of 1892, provision was made for an additional water supply, in case of need, pending the completion of the improvements which are being carried out in connection with the present waterworks. This provisional supply consists of 56 public wells, 34 useful private wells, 43 stations for boiling river water, and 126 connecting taps with the Altona and Wandsbeck systems. There are also 98 water carts for the distribution of this water, and 6 water boats to supply the shipping interests. A few of these wells were in use before the epidemic broke out, but most of them have been opened since that time. During the past few months at least 127 wells have been bored at the public expense, but only 39 of them have been found to furnish a useful water. More wells are being sunk. The popularity of the stations for boiling river water may be judged from the fact that several of the stations are visited by upwards of 1,400 people a day. The improvements which are nearing completion at the waterworks consist of 4 large subsiding basins and 18 filtering beds, on the principle of downward filtration through fine sand. The water will be taken from a point 2·4 kilometres further up stream than at present. The subsiding basins will have a capacity of 78,500 cubic metres each, and the water will be allowed to settle twenty-one hours before it is drawn off into the filtering beds. The filters are 18 large rectangular open basins, built of brick and cement on a clay base; each basin has a surface of 7,500 square metres, and a capacity furnishing 11,250 cubic metres of water per day, at a filtering rapidity of 62·5 millimetres per hour. The filter consists of a layer of sand 1 metre in thickness, spread over a layer of gravel and stone, which is 0·6 metres in thickness.

WATERBORNE CHOLERA IN INDIA.

India is very generally referred to as the "home of cholera." The disease is there established endemically throughout a wide area, but not, as most Indian authorities once believed, and many would even now

apparently often have us believe, in virtue of any local, mysterious, unknown, or unpreventable causes. It is so in virtue of conditions which may all of them be removed, and which in time I trust will be removed. In 1879 there were 318,000 deaths from cholera in India; in 1881 there were 161,000 deaths; in 1887, 488,000; and in 1888, 270,000. It must also be admitted that nearly all the great cholera epidemics can readily be traced back to India along lines of human intercourse. But what to my mind is entirely contrary to all we know of cholera, and is, from a practical common sense point of view, much to be deprecated, is the tendency in many quarters to regard the idea of eradicating cholera from India as impossible and ridiculous. I have waded through and studied, I think, all the reports and available information respecting India during the last thirty years, and have had the benefit of much personal converse on the subject with medical men who have spent years of their life in the "endemic area" of India, and in the result it seems to me as fatuous to deny the possibility of ridding that "endemic area" of cholera, as to deny the possibility of banishing typhoid fever from unwholesome localities in this country. I do not question the herculean nature of the task. The religious rites and superstitions prevailing in India, the ignorance and fanaticism of the natives, the enormous expenditure requisite, may all combine to render the difficulties of the task well nigh insurmountable in present circumstances. But let it be rationally realised that an endemic area of cholera in India is a removeable blot, and let those who are responsible for the government of India set to work to remove the food on which cholera grows, and in time to starve the scourge out of India. For my own part I am convinced that in India, as elsewhere, water has been the chief nurse and disseminator of cholera, and that if every town and village in India were provided with pure and properly-protected water the so-called endemic area would soon become indefinite, and would eventually disappear from the map. Why there should have been so much opposition to this contention, such needless straining to prove it groundless, or to shake its foundation, I am somewhat at a loss to understand. It is a fact that cholera, to all intents and purposes, fled from Madras and numerous other places immediately on the introduction of uncontaminated and properly protected water. Why should not the experiment which, when tried, has always been found successful, have been extended, or, at least, further tested in new localities? Happily, with the support of such eminent and practical Indian sanitarians as Drs. Macnamara, Townsend, De Renzy, Cornish, Payne, Simpson, Furnell, and Laurie, the contention that water is a frequent and common means of cholera diffusion in India is gaining ground, and must ere long bear good fruit.

Dr. M. C. Furnell, in his recent excellent book on the subject, expresses himself as firmly of opinion that the general method of the

propagation of cholera in India is by means of specifically polluted water. While in Europe, however, nearly every outbreak of cholera has been definitely traced to the contamination of the water supply, and much has been written about it, telluric and atmospheric conditions are distantly invoked by Indian authorities. These are terms of mystery and of indefinite meaning, which, unfortunately, have been adopted, however, by too many government officials, who cannot explain what they mean, and frequently use them as a cloak for ignorance. Dr. Furnell has had no difficulty in finding masses of facts in support of his opinions. The habits of the natives, though in direct opposition to their own laws and sacred writings, are such as tend to the most filthy pollution of the water supplied for their use. Where pure water has been supplied to the natives, as in Madras and Calcutta, and care has been taken to guard such sources of supply from pollution, cholera epidemics have become of infrequent occurrence and of greatly reduced fatality. In this opinion all the best authorities concur.

I will refer to the two great cities which are leading seats of government, and most under our influence. In the paper by Dr. W. J. Simpson, Medical Officer of Health, read at the British Medical Association, in August, 1888, he gave a description of Calcutta, Howrah, and the suburbs, dwelling especially on the water supply, the tanks, the drainage, the construction of the streets and houses, native and European; and the sanitary system generally. Calcutta, to the south of the native town, he stated is well built; the streets are wide and straight; the houses are large and have gardens attached; there is a liberal supply of excellent water, the drainage and cleansing are good, and that portion of the city compares favourably with the better parts of London. With a few exceptions, northern and native Calcutta is densely crowded, the streets are narrow and irregular, the drainage is bad, only the better and middle class have a fair supply of water; the poorer class have a very scanty water supply, and depend upon the water in the tanks. The native town is studded with wells and tanks. Neither Howrah, with its 100,000 inhabitants, nor the suburbs of Calcutta, with its 250,000, have any public water supply, with the exception of the wells and tanks. The insanitary condition of Howrah, without a public water supply, and without building regulations, is surpassed by the suburbs, which have no public water supply, no drainage, no building regulations, nor any effective conservancy arrangements. As a general rule, European residents in Howrah get their water from Calcutta by carriers, and they avoid the well and tank water. The personal habits of the natives are cleanly. As a religious duty they bathe at least once a day, the women more frequently, and this is done when convenient in the river Hooghly, but generally in the tanks near their houses or huts. The tanks are thus defiled by the excretions of the body, by the washing of dirty

clothes, frequently of clothes soiled by excretions of the sick, by human ordure due to the practice of children and others defecating on the banks of the tanks, and by the drainage and soakage from the surrounding huts and houses. Thus the water in the tanks, except during the rainy season, varies in quality from moderately polluted up to concentrated sewage, and this is the only water supply practically available for large numbers of the native population. Dr. Simpson traces out the connection between local outbreaks of cholera and a deficient and contaminated water supply, showing that those who have an abundant and pure water supply—namely, the European and better class of natives—escape cholera epidemics, except in isolated instances, which can generally be accounted for; while the natives who necessarily depend on the tank water, suffer severely when the tank becomes polluted by the excreta from a cholera patient. He says:

"I would particularly direct attention to this scarcity of water in the parts affected. Go almost where one may, in the northern part of the town, and especially in the riparian wards, there is the same complaint of the want of water, and a very valid one it is. It is a common occurrence to see the people grouped round one of the standposts, waiting their turn to fill their chatties, many of them to be disappointed, for the water from the standposts often comes in mere driblets, and the supply is exhausted or turned off before half the people are supplied. Scarcity of water brings in its train a great deal of sickness apart from cholera. The districts which have suffered most from scarcity of water have suffered also from a large amount of sickness of a dysenteric character."

The natives bathe, wash their utensils and clothes in the tanks, because it is the only available place for doing so; and they use the water of the tanks, contaminated in addition by soakage and sewage, for cooking and drinking, because it is the only available water supply for domestic purposes. The remedies for the condition of affairs described are simple enough, but they need time, and must involve considerable expense. The first requisite is a liberal water supply for Howrah and the suburbs, and a more liberal supply for Calcutta. Few will drink polluted water if they can obtain pure water. By specially constructed tanks, even the habits of the people can be so directed as to permit them to enjoy the luxury of the bath, and to perform their ablutions without danger. The second requisite is well-planned streets with free ventilation, good building arrangements, a system of drainage to pass through these streets, systematic clearing, levelling, paving and filling up ponds, draining, scavenging, removal of nuisance, and a well-organised sanitary department. The carrying out of these measures will ultimately convert Calcutta, Howrah and the suburbs, containing nearly 800,000 inhabitants, into as healthy a locality as any in the world, in so far as the prevalence of diseases not due directly to a sub-tropical climate is concerned,

and these measures of sanitation will change one of the most important centres in the endemic area of cholera into an area no longer marked by endemicity. Before any real progress in scientific medicine can be expected in India, the scientific branch of the medical service must be distinct from the administration, for when administrative functions preponderate, scientific research is relegated to such a subordinate position as to render it impossible to be carried out satisfactorily. A central institute is necessary, well-equipped, and having attached to it a body of men well trained in chemical, physiological, and biological methods, whose whole time should be devoted to scientific research.

I take another example from Dr. Furnell, the Surgeon-General, at Madras, writing, in 1886, an address on cholera. For many years before the introduction of the Red Hills water supply into Madras, the number of deaths from cholera annually amounted to hundreds, and too frequently to thousands; but from the year 1872, when the water supply was first opened, there has been a very large reduction in the mortality, one year being absolutely free from the disease, and in three others the deaths being 5, 6 and 2 respectively. Of course during the famine years there was a large increase in the fatal cases of cholera, caused by the migration into the town of many poor, half-starved creatures who had no strength left to resist the disease. But as soon as the famine was over the rate of mortality again fell to below 100 per annum; and during the last four years when there has been a severe epidemic of the disease throughout the greater part of the Madras presidency, the average number of deaths had not exceeded 250 per annum. The greater part of these deaths also, it is shown, took place in those parts of the town which had not had the benefit of the Red Hills water supply. Dr. Furnell, therefore, urges the necessity of extending the water supply to these localities. Our duty, then, lies before us; it is a grave and difficult task, but must be looked steadily in the face.

From Dr. Furnell, also, I gather that Pondicherry has a similar immunity from cholera, even while the disease is raging in the neighbouring English towns of Cuddalore, Chellumbrum, &c. Pondicherry town is supplied with water by artesian wells and also from a small lake situated some distance outside the town, from whence the water is led by pipes and distributed throughout the town. It is impossible to contaminate the source of the artesian wells, and great care is taken that the other source is also protected. To this unique water supply Dr. Furnell has attributed the immunity of Pondicherry from cholera. "If it is argued," he says, "that it is more likely owing to its general cleanliness and conservancy, I answer that while all must admit Pondicherry is a clean town (in that respect an example), still I cannot admit that it is so much cleaner than the neighbouring town of Cuddalore, where cholera flourished with much vigour; nor can I admit the difference is

owing to telluric, atmospheric, or local influences, for, to tell the truth, these terms convey no very definite ideas to my mind, and seem rather a convenient escape from ignorance than from any scientific explanation. For why, one may ask, should a certain spot in a contaminated district thus suddenly be exempt from these mysterious influences? Its unique water supply, free from contamination, seems to me a much more common sense explanation of the matter."

Here is another instance quoted by Dr. Furnell of the protection afforded to a community by a pure and uncontaminated water supply. It is Dr. Van Geyzel, of Ganjam, who thus describes it: "The port of Gopaulpore (Ganjam district) has enjoyed a remarkable immunity from epidemic cholera under circumstances which are sometimes considered very favourable to the spread of the disease. Cholera has this year (1885) raged all over the district, from Rumbha to Chicacole, and from east to west; the villages in the neighbourhood of Gopaulpore furnished not a small proportion of cases. When it is remembered that from these very villages hundreds of coolies go daily to Gopaulpore for work, and back again; that a stream of carts, about 150 on an average, keeps daily pouring into Gopaulpore from various parts of the district and out again, it goes without saying that Gopaulpore is by no means isolated in any way, but on the contrary, it has as frequent and large a communication with the interior parts of the district as Aska or Rumbha, or even Berhampore, in all of which places it may be said that cholera is very seldom absent. During this year only three cases of cholera occurred in Gopaulpore. These cases arrived already suffering from the disease. In this way the disease has occurred, now and again, chiefly among people coming from other places, but it has not gained a foothold. The general sanitary condition of Gopaulpore, though much improved of late, is by no means what is to be desired. There is, however, one circumstance which makes Gopaulpore unique in respect of its water supply; it has absolutely no tanks whatever. There are thirty-five wells in the village for a population of 2,675 people, good, bad, and indifferent. Lately some wells have been sunk by Mr. Minchin, who generously allows people to take drinking water from them, and they are freely resorted to. The immunity of Gopaulpore from epidemics of cholera while it was surrounded by infected villages with which abundant daily communication took place, as well as with other and more remote parts of the district, especially at a time when cholera was raging epidemically generally over the whole district, and the inability of the disease to establish itself, although it was imported on many occasions, point to the want of something by which the disease could be propagated and spread. In this connection the absolute absence of tanks is well worthy of note.

A further example of the influence of the water supply upon cholera

in India is furnished by the 85,000 inhabitants of the city of Nagpur, the capital or chief city of the central provinces. In 1872 that city was supplied from the "Ambaghiri reservoir." In the seven years previous to the opening of this water supply there were 1,264 deaths from cholera, while in the next seven years after that date Nagpur had only 177 deaths from that disease. It has been further remarked in Nagpur that after the opening of the water supply the cholera was limited almost exclusively to that part of the city in which impure water was still used, such as that of surface streams and open tanks.

The following interesting account of a cholera epidemic in the Salem district in 1881 is extracted from the annual report of the sanitary commissioner of Madras for that year. It appears that by far the greater number of deaths occurred among people using the river water, which is described as defiled by the filth from drains, the filth from dirty clothes, and the filth from men's bodies. It appears also that more than five-sevenths of the whole number attacked occurred among caste Hindus, people who obstinately cling to the use of this river water from religious belief. The Mussulman population almost escaped; the European and East Indian entirely; and strangest of all, the inhabitants of Kitchipoliem, Chucklers, low caste people who are engaged in most filthy occupations, and who are not allowed to use the river water, also enjoyed an immunity from this dread scourge. The course of the disease is shown to have been mainly along the banks of the river, and the village of Kitchipoliem, mentioned as having enjoyed an immunity from the disease, is situated well away from the river. That the use of the river water alone is not to be justly saddled as the cause of the disease, is evidenced by the statement that the division of the town in which the inhabitants used well water instead of that of the river suffered as severely from cholera as most of the other parts of the town along the river banks. Apart from all this it is added: "The curious feature of the epidemic is its weighty incidence on children, nearly one-half of those attacked being children under 15 years of age, and fully one-half of the deaths occurring among them."

Again, in the Punjab sanitary report for 1869 Surgeon-Major A. C. De Renzy called attention to the remarkable fact that the Fort of Peshawar had almost passed unscathed from the terrible epidemics which had visited that station, and that this immunity was the more remarkable because the fort was extremely unhealthy. Dr. De Renzy attributed the circumstance to the fact that the fort was supplied with water from a well which, though an extremely bad one, was more safe from choleraic contamination than the roadside gutter water so generally used in the cantonment. On visiting Peshawar in company with Dr. Cunningham a few years later Dr. De Renzy was surprised to find that the European troops in the fort had suffered with special severity, and

for a time he doubted the correctness of his own explanation. But casually and after some days the novelty of an epidemic in the fort became less inexplicable. It appeared that about a week before the appearance of cholera at Peshawar the medical officer of the fort seeing how bad was the fort water and how much the troops were suffering from fever, and not knowing anything of what Dr. De Renzy had written about the immunity of the fort from cholera, had recommended the supply of cantonment water, and this water was accordingly sent in casks, the distance being about two miles. The water was supposed to be taken, as ordered, from a certain good well, but it seems that in one case at least, the water carriers, to save themselves the trouble of lifting water by means of ropes and pulley blocks from a depth of 90 feet, had filled their vessels from the roadside gutters. Whether they did so or not in the case under consideration is unknown, but the fact remains that in 1872 for the first time in the history of the fort, the European troops were supplied with cantonment water, and that this was also the first occasion of their being affected with cholera. The native portion of the garrison continued to use the well water as formerly and enjoyed their former immunity from the disease.

Religious pilgrimages are a fruitful means of spreading cholera in the east. In 1866, 30,000 pilgrims died of cholera at Mecca. And here let me mention one of the customs of that pilgrimage which goes far to explain the intensity and the fearful mortality which attend any outbreak of cholera among the Meccan pilgrims. At a given period the pilgrims stand naked in turn by the holy well; a bucket of water is poured over each man; he drinks what he can of it, and the rest falls back into the well. The water of this well has been analysed by an English chemist, Dr. Frankland; it is fearfully polluted with abominable contaminations. In 1866, within a few days of the ceremony, the road for twelve miles to the foot of Mount Ararat was thickly strewn with dead bodies.

In a report in June, 1891, Dr. W. J. Simpson, an able and energetic health officer of Calcutta, gave an interesting account of two large pilgrimages which he personally witnessed in that year—one in the endemic area of Bengal and the other in the non-endemic area or north part of India. The first of these pilgrimages was the Ardhodoya Jog, which is held at Calcutta and other sacred places near Calcutta, at rare intervals of 27 or 28 years. The purity to be obtained by bathing in the Ganges during this festival is exceptionally great, and therefore the gathering of pilgrims at the several bathing shrines was, on its own merits, a very large one. Kalighat, where the gathering in question took place, is in the suburban area of Calcutta, on Tolly's Nulla, a small tidal creek which is held to be more sacred than the Hooghly. The Nulla can be waded across at low tide, but it is the receptacle of unspeakable filth of

all kinds. After describing the insanitary arrangements of the neighbourhood, Dr. Simpson remarks that "without a good water supply, or drainage, or proper means of disposal of the excreta and sulliage, with crowding together of huts and houses irregularly placed, and with the filthy tidal Nulla, which is practically the sewer of the district, and with numerous polluted tanks, Kalighat, it may be surmised, is at no time a healthy spot, and at all times a danger to pilgrims." On the occasion in question at least 150,000 people came into Calcutta in the first and second week of February, and to describe the crowding which occurred in the Nulla on the festival day is difficult. Dr. Simpson performs this task very graphically by appending to his report a photograph which he himself took on the morning of February 8. The crush is seen to be very great, and it is marvellous that no accidents happened; the tide is low, and the bathers, even in mid-stream, have not the water much above their knees. A collection of boats, extending as far as one can see, is so great and close together that only occasional glimpses of the water are to be obtained, and these boats are crowded with men, women, and children. Dr. Simpson gives details of an outbreak of cholera which occurred among these people, as many as 51 cases appearing on February 11. The pilgrims had to be soon dispersed, and though this dispersal checked a larger outbreak at Kalighat which would have only widened its circle afterwards, it could not prevent those already infected from suffering on their way home. Consequently, at some of the principal railway stations sick people had to be taken out of the trains; passengers by boat died on their voyage, their bodies being thrown overboard; while travellers on foot were picked up dying and dead on the roads.

Dr. Simpson's description of the great Kumb festival, which occurs once in twelve years at Hurdwar, is also very graphic, and photographs taken by Dr. Simpson at the festival of 1891—copies of which I have before me—show the sacred pools and the approaches to them to be hidden by a mass of semi-naked human beings. The pollutions to which the sacred pool is exposed on these occasions are indescribable. There is not only the washing of the naked fakirs who cover themselves with wood-ashes as their only clothing, and the general bathing of the pilgrims, who are not all in the cleanest of clothes—several, moreover, on the occasion in question being seen bathing with skin diseases upon them—but the ashes of deceased relatives, enclosed in little red bags, are brought from the different homes of the pilgrims and thrown into the pool. Can it be wondered at that, when cholera cases have been among the pilgrims, disease and death should have spread broadcast?

Reverting again to the sanitary administration of India, and the difficulties to be encountered, I fully recognise that much has been done in the way of sanitary reform under English rule. This was shown by Surgeon-

General Sir W. Moore, in an interesting paper read by him before the International Congress of Hygiene, which met in London in 1891; but at the same congress the authors of numerous other papers showed the amount of sanitary work still urgently waiting to be done in India. One and all of those authors placed the need for better water as the most pressing want throughout India, especially in the villages, which contain 95 per cent of the people of India.

Greater energy and more systematic administration are much needed in regard to the sanitation of India, and England's imperial responsibilities in this matter are very heavy, not only to the native races under her protection, but to civilisation at large. At the International Hygienic Congress in Vienna, the remark was constantly made, "You English have, by your sanitary improvements, prevented cholera from gaining a foothold in England. Why do you not attack it in its birthplace, and prevent it from springing into life in India?" And the same question has more recently been asked by Dr. Talafuss, of Tiflis, and by M. Monod, the Director of the Public Health Department of the French Ministry of the Interior, in his work on Cholera in Finistère. We may well closely question ourselves why we have not succeeded in carrying further than we have done the great work of improving the sanitary circumstances of Indian populations. It has not been, as Sir Douglas Galton has pointed out, for want of knowledge. The following scheme for a new public health service for India has been drawn up by an eminent medical officer in India, who has himself long been engaged in sanitary work and organisation. I commend it as a useful suggestion to our Indian Government.

1. An Imperial Sanitary Department attached to the Government of India.

2. A Provincial Sanitary Department attached to each of the provincial Governments, such as Bengal, N. W. Provinces, Punjâb, Madras, Bombay, Central Provinces, &c.

3. A Local Sanitary Department attached to each municipality, district board, &c.

1. The Imperial Sanitary Department should be administrative and scientific, and quite distinct from the sanitary department of the army. It should consist of—1. The Sanitary Commissioner with the Government of India 2. Deputy Sanitary Commissioner. 3. A Medical Statist. 4. Veterinary Commissioner. 5. Sanitary Engineer. 6. A Minister of Health, having a seat in the Viceroy's Council as President. Scientific agents—Laboratory with trained experts. Duties—The advising of the Viceroy and Council on important health matters, either initiated by the Imperial Sanitary Department or referred to it by the Local Governments; the collection and publication of information as to epidemic disease existing in India and in other countries; the right of asking from Provincial Governments what they propose to do or have

done in checking or inquiring into diseases affecting man, animals or agriculture in their provinces; the arranging that adminstration reports shall be drawn up on a uniform plan for ready reference; the acquiring of all information regarding the movements of pilgrims, coolies and emigrants; the advising the Provincial Government, and requiring the latter to take proper precautions; the consideration of new sanitary laws, &c.

2. Provincial Departments to consist of the following sanitary officers, appointed by the Local Government:—1. Sanitary Commissioner. 2. Assistant Sanitary Commissioner. 3. Sanitary Engineers. 4. A President, who should be a high officer in the Civil Service. Travelling agents—Deputy Sanitary Commissioners or Inspectors, Veterinary Surgeons, Deputy Sanitary Engineers, as may be required. Scientific agents—Trained Professors and Assistants in Government laboratory for bacteriological, chemical, agricultural work, &c., and general sanitary investigations requiring to be done in laboratory. Duties—To control local authorities; to institute special investigations at any particular spot on any particular subject; to make by-laws and amend sanitary laws; to investigate diseases of men and animals, and study agricultural pests, &c.; to analyse waters, &c.

3. Local Sanitary Departments, to consist of Municipal Commissioners or District Magistrates, with Civil Surgeon when obtainable. Executive agents—A Health Officer, attached for one or more towns; an Engineer in similar position, and a Sanitary Staff for each place as required. Duties—Conservancy, water supply, building regulations, drainage, registration of births and deaths, vaccination, stamping out of infectious disease and informing provincial authority by weekly reports as to prevalence of cholera, smallpox or other dangerous disease.

THE FOUR-YEAR COURSE IN AMERICA.

In consequence of the increasing number of qualifying bodies in the United States and Canada which reqnire a four-year course of medical study, the Iowa State Board of Medical Examiners has adopted the following resolution:—"That after July 4, 1898, no medical college shall be recognised by this Board as 'of good standing' within the meaning of Section 1, Chapter 104, Laws 1886, that does not require as a condition of graduation four graded courses of medical lectures of not less than six months each—no two of which said courses shall be within the same calendar year. That graduation from any college of Dentistry, and Veterinary Medicine, or of Pharmacy, upon a satisfactory examination in anatomy, recognised by this Board as of good standing, may be accepted as the equivalent of the first year's course of medical lectures by colleges requiring as a condition of graduation the graded courses above specified."

SANITARY AND METEOROLOGICAL NOTES.

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Vital Statistics

For four Weeks ending Saturday, October 7, 1893.

The deaths registered in each of the four weeks in the sixteen principal Town Districts of Ireland, alphabetically arranged, corresponded to the following annual rates per 1,000 :—

Towns	Weeks ending				Towns	Weeks ending			
	Sept. 16	Sept. 23	Sept. 30	Oct. 7		Sept. 16	Sept. 23	Sept. 30	Oct. 7
Armagh -	7·0	28·0	21·0	14·0	Limerick -	19·6	22·5	30·9	30·9
Belfast -	22·6	25·6	23·2	21·4	Lisburn -	8·5	21·3	38·3	21·3
Cork -	20·1	22·8	18·0	11·8	Londonderry	14·1	22·0	17·3	12·6
Drogheda	22·0	22·0	35·1	8·8	Lurgan -	13·7	22·8	9·1	18·2
Dublin -	27·9	23·9	21·9	22·1	Newry -	8·1	16·1	20·1	8·1
Dundalk -	8·4	33·5	12·6	16·8	Sligo -	35·5	15·2	30·5	25·4
Galway -	15·1	3·8	49·1	11·3	Waterford -	25·0	30·0	30·0	20·0
Kilkenny	28·3	28·3	4·7	33·0	Wexford -	13·5	18·1	22·6	36·1

In the week ending Saturday, September 16, 1893, the mortality in thirty-three large English towns, including London (in which the rate was 17·5), was equal to an average annual death-rate of 19·8 per 1,000 persons living. The average rate for eight principal towns of Scotland was 18·7 per 1,000. In Glasgow the rate was 18·3, and in Edinburgh it was 17·3.

The average annual death-rate represented by the deaths registered during the week in the sixteen principal town districts of Ireland was 23·2 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 4·9 per 1,000, the rates varying from 0·0 in Newry, Dundalk, Drogheda, Wexford, Lurgan, and Armagh to 6·3 in Londonderry—the 9 deaths from all causes registered in the last-named district comprising 1 from measles and 3 from diarrhœa. Among the 115 deaths from all causes registered in Belfast were 2 from measles, 3 from

whooping-cough, 1 from enteric fever, and 22 from diarrhœa. The 14 deaths in Limerick comprise 2 from measles, and the 10 deaths in Waterford comprise 2 from enteric fever.

In the Dublin Registration District the registered births amounted to 197—92 boys and 105 girls; and the registered deaths to 190—90 males and 100 females.

The deaths, which are 23 under the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 28·3 in every 1,000 of the population. Omitting the deaths (numbering 3) of persons admitted into public institutions from localities outside the district, the rate was 27·9 per 1,000. During the first thirty-seven weeks of the current year the death-rate averaged 27·0, and was 1·0 below the mean rate in the corresponding period of the ten years 1883–1892.

Forty-eight deaths from zymotic diseases were registered, being 13 above the average for the corresponding week of the last ten years, and 8 over the number for the week ended September 9. They comprise 1 from measles, 2 from whooping-cough, 1 from ill-defined fever, 13 from enteric fever, 1 from cholerine, 25 from diarrhœa (being 6 over the number from that cause in the preceding week, but 11 under the number for the week ended September 2), and 2 from erysipelas. Twenty-two of the 25 deaths from diarrhœa were of children under 5 years of age, 18 being of infants under 1 year old.

The number of cases of enteric fever admitted to hospital was 55, being a decline of 3 as compared with the admissions for the preceding week: 21 enteric fever patients were discharged, 7 died, and 192 remained under treatment on Saturday, being 27 over the number in hospital on Saturday, Septemher 9.

Eight cases of scarlatina were admitted to hospital, being 2 over the admissions for the preceding week, and equal to the number admitted in the week ended September 2. Six patients were discharged, and 55 remained under treatment on Saturday, being 2 over the number in hospital at the close of the preceding week.

The hospital admissions for the week included, also, 5 cases of measles (being a decline of 7 as compared with the number for the preceding week) and 1 of typhus: 20 cases of measles and 1 of typhus remained under treatment in hospital on Saturday.

There were but 12 deaths from diseases of the respiratory system registered, being 7 under the average for the corresponding week of the last ten years, and 1 under the low number for the week ended September 9. The 12 deaths comprise 6 from bronchitis and 3 from pneumonia or inflammation of the lungs.

In the week ending Saturday, September 23, the mortality in thirty-

three large English towns, including London (in which the rate was 18·9), was equal to an average annual death-rate of 19·7 per 1,000 persons living. The average rate for eight principal towns of Scotland was 17·3 per 1,000. In Glasgow the rate was 17·8, and in Edinburgh it was 17·7.

The average annual death-rate in the sixteen principal town districts of Ireland was 23·8 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 4·8 per 1,000, the rates varying from 0·0 in Galway, Lisburn, Drogheda, Lurgan, Kilkenny, and Armagh, to 7·1 in Belfast—the 130 deaths from all causes registered in the last-named district comprising 1 from scarlatina, 6 from whooping-cough, 7 from enteric fever, and 22 from diarrhœa. The 33 deaths registered in Cork comprise 1 from whooping-cough and 5 from diarrhœa. Among the 16 deaths in Limerick are 3 from measles and 2 from diarrhœa, and the 14 deaths in Londonderry comprise 2 from diphtheria.

In the Dublin Registration District the registered births amounted to 204—109 boys and 95 girls; and the registered deaths to 161—84 males and 77 females.

The deaths, which are 2 under the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 24·0 in every 1,000 of the population. Omitting the death of 1 person admitted to hospital from without the district, the rate was 23·9 per 1,000. During the first thirty-eight weeks of the current year the death-rate averaged 27·0, and was 0·9 under the mean rate in the corresponding period of the ten years 1883-1892.

The number of deaths from zymotic diseases registered was 40, being 7 over the average for the corresponding week of the last ten years, but 8 under the number for the week ended September 16. The 40 deaths comprise 1 from scarlet fever (scarlatina), 1 from influenza, 2 from whooping-cough, 1 from diphtheria, 8 from enteric fever, 2 from choleraic diarrhœa, 15 from diarrhœa (being 10 under the number from that cause in the preceding week), 2 from dysentery, and 2 from erysipelas.

The number of cases of enteric fever admitted to hospital was 43, being 12 under the admissions for the preceding week, and 15 under the number for the week ended September 9. Twenty-two enteric fever patients were discharged, 5 died, and 208 remained under treatment on Saturday, being 16 over the number in hospital at the close of the preceding week.

Only 2 cases of scarlatina were admitted to hospital, against 8 admissions in the preceding week: 11 patients were discharged, and 46 remained under treatment on Saturday, being 9 under the number in hospital on Saturday, September 16.

Nine cases of measles were admitted to hospital, being 4 in excess of the admissions for the preceding week, but 3 under the number for the

week ended September 9. Eighteen cases of the disease remained under treatment in hospital on Saturday.

Fifteen deaths from diseases of the respiratory system were registered, being 3 over the low number for the preceding week, but 3 under the average for the 38th week of the last ten years. They comprise 8 from bronchitis and 6 from pneumonia or inflammation of the lungs.

In the week ending Saturday, September 30, the mortality in thirty-three large English towns, including London (in which the rate was 20·1), was equal to an average annual death-rate of 20·2 per 1,000 persons living. The average rate for eight principal towns of Scotland was 19·6 per 1,000. In Glasgow the rate was 20·3, and in Edinburgh it was 21·0.

The average annual death-rate represented by the deaths registered in the sixteen principal town districts of Ireland was 22·7 per 1,000 of the population, based on the Census of 1891.

The deaths from the principal zymotic diseases in the sixteen districts were equal to an annual rate of 3·9 per 1,000, the rates varying from 0·0 in Londonderry, Galway, Dundalk, Drogheda, Wexford, Lurgan, and Armagh, to 12·8 in Lisburn—the 9 deaths from all causes registered in the last-named district comprising 3 from diarrhœa. Among the 118 deaths from all causes registered in Belfast are 2 from measles, 1 from scarlatina, 1 from typhus, 4 from whooping-cough, 1 from diphtheria, 4 from enteric fever, 1 from English cholera, and 12 from diarrhœa. Among the 26 deaths in Cork are 3 from diarrhœa. The 22 deaths in Limerick comprise 3 from measles, 2 from typhus, and 2 from diarrhœa.

In the Dublin Registration District the registered births amounted to 213—101 boys and 112 girls; and the registered deaths to 156—91 males and 65 females.

The deaths, which are 15 under the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 23·3 in every 1,000 of the population. Omitting the deaths (numbering 9) of persons admitted into public institutions from localities outside the district, the rate was 21·9 per 1,000. During the first thirty-nine weeks of the current year the death-rate averaged 26·9, and was 0·9 under the mean rate in the corresponding period of the ten years 1883–1892.

The number of deaths from zymotic diseases registered was 29, being 11 under the number for the preceding week, and 2 below the average for the thirty-ninth week of the last ten years. The 29 deaths comprise 1 from measles, 1 from influenza, 1 from whooping-cough, 6 from enteric fever, 1 from choleraic diarrhœa, 16 (including 14 deaths of children under 5 years of age) from diarrhœa, and 1 from erysipelas.

The number of cases of enteric fever admitted to hospital, which had fallen from 58, for the week ended September 9, to 55 for the following week, and to 43 for the week ended September 23, further declined to 38.

Thirty-one enteric fever patients were discharged, 1 died, and 214 remained under treatment on Saturday, being 6 over the number in hospital at the close of the preceding week.

Thirteen cases of scarlatina were admitted to hospital, against 2 admissions in the preceding week, and 8 in the week ended September 16. One patient was discharged and 58 remained under treatment on Saturday, being 12 over the number in hospital at the close of the preceding week.

The hospital admissions for the week included, also, fifteen cases of measles (against 9 admissions for the preceding week). Twenty-five cases of the disease remained under treatment in hospital on Saturday.

Eighteen deaths from diseases of the respiratory system were registered, being 3 over the number for the preceding week, but 2 under the average for the 39th week of the last ten years. They comprise 10 from bronchitis and 6 from pneumonia or inflammation of the lungs.

In the week ending Saturday, October 7, the mortality in thirty-three large English towns, including London (in which the rate was 17·9), was equal to an average annual death-rate of 18·5 per 1,000 persons living. The average rate for eight principal towns of Scotland was 19·5 per 1,000. In Glasgow the rate was 19·6, and in Edinburgh it was 17·5.

The average annual death-rate in the sixteen principal town districts of Ireland was 20·6 per 1,000 of the population, according to the Census of 1891.

The deaths from the principal zymotic diseases registered in the sixteen districts were equal to an annual rate of 3·7 per 1,000, the rates varying from 0·0 in nine of the districts to 9·8 in Limerick—the 22 deaths from all causes registered in that district comprising 6 from measles and 1 from enteric fever. Among the 109 deaths from all causes registered in Belfast are 2 from measles, 8 from whooping-cough, 2 from enteric fever, and 11 from diarrhœa. The 8 deaths in Londonderry comprise 1 from enteric fever and 1 from diarrhœa. The 7 deaths in Kilkenny comprise 1 from measles and 1 from simple-continued fever.

In the Dublin Registration District the registered births amounted to 181—91 boys and 90 girls; and the registered deaths to 156—79 males and 77 females.

The deaths, which are 1 over the average number for the corresponding week of the last ten years, represent an annual rate of mortality of 23·3 in every 1,000 of the population. Omitting the deaths (numbering 8) of persons admitted into public institutions from localities outside the district, the rate was 22·1 per 1,000. During the first forty weeks of the current year the death-rate averaged 26·8, and was 0·9 under the mean rate in the corresponding period of the ten years 1883–1892.

Thirty-six deaths from zymotic diseases were registered, being 7 over

the number for the preceding week, and 8 above the average for the fortieth week of the last ten years. They comprise 1 from measles, 1 from influenza, 6 from whooping-cough, 7 from enteric fever, 1 from infantile cholera, 13 (including 11 deaths of children under 5 years of age) from diarrhœa, and 2 from erysipelas.

The number of cases of enteric fever admitted to hospital, which had fallen from 55 for the week ended September 16 to 43 for the following week, and to 38 for the week ended September 30, further declined to 27. Twenty-seven enteric fever patients were discharged, 4 died, and 210 remained under treatment on Saturday, being 4 under the number in hospital at the close of the preceding week.

Only 4 cases of scarlatina were admitted to hospital, against 13 admissions in the preceding week: 13 scarlatina patients were discharged, and 49 remained under treatment on Saturday, being 9 below the number in hospital at the close of the preceding week.

The hospital admissions for the week included, also, 10 cases of measles, being 5 under the number for the preceding week: 24 cases of the disease remained under treatment in hospital on Saturday.

The number of deaths from diseases of the respiratory system was 16, being 2 under the number for the preceding week, and 5 below the average for the fortieth week of the last ten years. The 16 deaths comprise 8 from bronchitis and 6 from pneumonia or inflammation of the lungs.

Meteorology.

Abstract of Observations made in the City of Dublin, Lat. 53° 20′ N., Long. 6° 15′ W., for the Month of September, 1893.

Mean Height of Barometer, - - -	29·848 inches.
Maximal Height of Barometer (on 12th, at 9 a.m.), -	30·345 ,,
Minimal Height of Barometer (on 29th, at 9 a.m.), -	29·052 ,,
Mean Dry-bulb Temperature, - - -	54·8°.
Mean Wet-bulb Temperature, - - -	51·8°.
Mean Dew-point Temperature, - - -	48·9°.
Mean Elastic Force (Tension) of Aqueous Vapour, -	·350 inch.
Mean Humidity, - - - - -	81·3 per cent.
Highest Temperature in Shade (on 5th), - -	72·0°.
Lowest Temperature in Shade (on 21st), - -	38·2°.
Lowest Temperature on Grass (Radiation) (on 24th)	31·7°.
Mean Amount of Cloud, - - - -	47·4 per cent.
Rainfall (on 14 days), - - - -	·729 inch.
Greatest Daily Rainfall (on 6th), - - -	·174 inch.
General Directions of Wind - - -	N.W., W.

Remarks.

September, 1893, was favourable throughout. It was a month of average temperature, with fresh westerly and north-westerly winds, and frequent showers, but no heavy rains near Dublin. At times the nights were very sharp, and even frosty, but, on the other hand, much bright sunshine was enjoyed by day. Towards the close the autumnal tints in the foliage were lovely beyond compare.

In Dublin the arithmetical mean temperature (55·9°) was as nearly as possible equal to the average (55·8°); the mean dry bulb readings at 9 a.m. and 9 p.m. were 54·8°. In the twenty-eight years ending with 1892, September was coldest in 1886 and in 1882 (M. T. = 53·0°), and warmest in 1865 (M. T. = 61·4°). In 1880, the M. T. was as high as 58·6°; in 1879 (the "cold year"), it was 54·3°; in 1887, 54·0°; in 1888, 54·4°; in 1889, 55·8°, or exactly the average; in 1890 it was as high as 59·6°; in 1891, it was 57·6°, and in 1892, 54·5°. So warm a September as that of 1890 had not occurred for a quarter of a century.

The mean height of the barometer was 29·848 inches, or 0·062 inch below the corrected average value for September—namely, 29·910 inches. The mercury rose to 30·345 inches at 9 a.m. of the 12th, and fell to 29·052 inches at 9 a.m. of the 29th. The observed range of atmospherical pressure was, therefore, 1·293 inches—that is, a little more than one inch and a quarter.

The mean temperature deduced from daily readings of the dry bulb thermometer at 9 a.m. and 9 p.m. was 54·8°, or as much as 6·5° below the value for August, 1893. Using the formula, *Mean Temp.* = *Min.* + (*max.*—*min.* × ·476), the mean temperature was 55·5°, or exactly equal to the average mean temperature for September, calculated in the same way, in the twenty-five years, 1865–89, inclusive (55·5°). The arithmetical mean of the maximal and minimal readings was 55·9°, compared with a twenty-five years' average of 55·8°. On the 5th the thermometer in the screen rose to 72·0°—wind, S.S.W.; on the 21st the temperature fell to 38·2°—wind, N.W. The minimum on the grass was 31·7° on the 24th. On the 21st the grass minimum was 31·9°.

The rainfall was only ·729 inch, distributed over as many as 14 days—the rainfall was thus considerably below the average. The average rainfall for September in the twenty-five years, 1865–89, inclusive, was 2·176 inches, and the average number of rainy days was 14·7. In 1871 the rainfall in this month was very large—4·048 inches on, however, only 13 days. On the other hand, in 1865 only ·056 inch was measured on but 3 days. In 1888, the rainfall was only ·728 inch on 10 days; in 1889, 1·043 inches fell on 13 days; in 1890, 2·469 inches on 14 days; in 1891, 2·132 inches on 18 days; and in 1892, 2·631 inches on 19 days.

High winds were noted on as many as 14 days, but attained the force of a gale on no occasion in Dublin. An aurora appeared on the 1st. Lightning was seen on the 8th and 21st. Thunder was heared on the 21st. The atmosphere was foggy on the 3rd, 4th, and 12th.

The month opened with an anticyclone forming over Ireland, where the weather during the first two days was mild and fine, although rather cloudy. In England rain had fallen, and the weather was taking up. In Scotland conditions were still unsettled and rainy. North-westerly winds were prevalent in nearly all parts of the United Kingdom.

During the week ended Saturday, the 9th, the weather, which was at first fair and warm, afterwards became cloudy, showery, squally, and finally cold for the time of year. On Sunday morning an anticyclone lay right over the British Islands, in all parts of which the barometer was high and remarkably uniform, the morning readings varying not one-tenth of an inch, from 30·30 inches at Loughborough, in Leicestershire, to 30·22 inches at Belmullet, in Mayo, and 30·21 inches at Valentia Island in Kerry. The weather was fair and bright after a calm, dewy, and (in places) foggy morning. During the following two days the anticyclone retreated in a south-easterly direction to the Continent and the barometer fell steadily. The wind meanwhile became S.W. in the North, and E. or S.E. in the South, temperature rising considerably on Tuesday—to 72° in Dublin and at Leith, 74° at York and Hurst Castle, 75° at Oxford, and 77° in London, at Loughborough and Cambridge. Wednesday was still hotter in the midlands and south of England, the thermometer reaching 80° at Cambridge and 81° in London; but already a decided fall of temperature had begun in Scotland and Ireland, and was spreading south-eastwards with clouds, rain, and high westerly winds. On Friday a V.-shaped thunderstorm depression travelled south-eastwards across Great Britain, and in its rear temperature gave way still more rapidly, so that Saturday was quite a cool day. In Dublin the mean atmospheric pressure was 29·914 inches, pressure ranging between 30·275 inches at 9 a.m. of Sunday (wind E.N.E.), and 29·570 inches at 9 p.m. of Wednesday (wind W.S.W.). The corrected mean temperature was 58·7°. The mean dry bulb temperature at 9 a.m. and 9 p.m. was 57·3°. On Tuesday the screened thermometers rose to 72·0°, on Saturday they fell to 44·0°. Rain was registered on three days, the total measurement being ·252 inch, of which ·174 inch was recorded on Wednesday. Sheet lightning was seen on the eastern horizon on Friday evening. The prevalent winds were S.W. and N.N.W.

The two most striking features in the weather of the week ended Saturday, 16th, are the low night temperatures at the beginning and the continuous drought, except in the north and the extreme south of the British Islands. During Sunday and Monday a depression was passing south-eastwards from the mouth of St. George's Channel across the Bay

of Biscay to the Peninsula. This disturbance caused heavy rains in the extreme S.W. of England, along the west coast of France, and finally in central Spain. Its presence was made evident from Dublin on Saturday, the 9th, as well as throughout Sunday, by a sheet of cirriform cloud which kept travelling in an upper current from W. to E. over the southern half of the sky. A strong easterly wind at the same time showed that an area of low barometer lay to the southward. As this breeze died down, the nights became very sharp in England and Ireland. At Parsonstown the screened thermometer fell to 36° on Monday night and to 31° on Tuesday night. At Loughborough also the minimum on Monday night was 31°, or one degree below freezing-point. Large depressions now began to pass eastward across Northern Europe, so that for the rest of the week squally westerly (S.W. to N.W.) winds, high but variable temperatures, and cloudy skies—with heavy rain in the extreme north—were experienced. At Glencarron, in Ross-shire, the rainfall of this week was as much as 6 inches. In Dublin the mean height of the barometer was 30·146 inches, readings varying from 30·345 inches at 9 a.m. of Tuesday (wind calm), to 29·923 inches at 9 p.m. of Saturday (wind N.W.). At 4 p.m. of this day a reading of 29·892 inches was recorded. The corrected mean temperature was 56·9°. The mean dry bulb readings in the screen at 9 a.m. and 9 p.m. were 57·1°. On Tuesday the minimum was 40·5°, on Friday the maximum was 70·0°. Light showers fell on Friday evening, yielding only ·008 inch of rain. The prevalent winds were E., W.S.W., and N.W.

All through the week ended Saturday, the 23rd, the atmosphere was in a disturbed state over north-western Europe, and cyclonic conditions prevailed generally. On Tuesday and the two following days a depression of the first magnitude lay between Scotland and Norway, while a series of secondary depressions travelled south-eastwards across the British Islands, keeping the weather in a changeable, squally, showery condition, especially on our northern and north-western coasts. The amount of atmospherical depression may be gauged by the fact that on Tuesday the barometer fell to 28·76 inches at Sumburgh Head, in the Shetlands. On Wednesday evening sheet lightning was seen from the shores of the Irish Sea, St. George's Channel, and the English Channel. At night sharp frost occurred over central Ireland and in some inland parts of England also. At 8 a.m. of Thursday a thunderstorm prevailed in the Scilly Isles, connected with a large secondary depression which at that time lay over Brittany. On the evening of this day massive cumuli and nimbi were seen from the east coast of Ireland passing southwards down the Irish Sea—vivid flashes of lightning shot from these clouds from time to time, and distant thunder was heard at intervals. On Friday night another secondary depression brought a considerable rainfall, followed by a renewed fall of temperature and fresh northerly winds on Saturday. On-

Friday and Saturday showers of snow and sleet fell in Scotland and over the north of England. In Dublin the mean height of the barometer was 29·612 inches, readings decreasing from 29·832 inches at 9 a.m. of Sunday (wind W.N.W) to 29·330 inches at 3 p.m. of Tuesday (wind also W.N.W.), but rising again intermittently to 29·877 inches at 9 p.m. of Saturday (wind N.W.). The corrected mean temperature was 50·9°. The mean dry bulb readings at 9 a.m. and 9 p.m. were 50·2°. On Monday the thermometer rose to 63·8° in the shade; on Thursday it fell to 38·2° in the shade and to 31·9° on the grass. The rainfall was ·191 inch on four days—·112 inch being measured on Friday. The wind was generally N.W., varying only between W. and N.

A cyclonic distribution of atmospherical pressure over western and northern Europe caused the weather to be of a changeable, showery, and squally character throughout the week ended Saturday, the 30th. At the beginning, no doubt, an anticyclone was found over Ireland in the rear of a depression overlying the Skager Rack, but this high pressure area soon gave place to a new disturbance, which at 8 a.m. of Tuesday had its centre over Donegal, Derry, and Antrim. This system travelled eastwards, causing heavy rain, first in the north of Ireland, afterwards in the north of England. Indeed, on Wednesday thunderstorms occurred generally along the east coast of England and at the Helder, in connection with this depression. By 8 a.m. of Thursday a very decided reduction of pressure was in progress all over the British Islands and Scandinavia and a large and deep depression was approaching the N.W. of Scotland. The showers now became heavier and more frequent in nearly all places, while the wind blew more and more gustily and strongly from S.W. or W. At 8 a.m. of Friday the barometer was down to 28·65 inches at Stornoway in the Hebrides, where a fresh southerly gale was blowing. The reading was 30·00 inches at Nice and 30·06 inches at Lisbon at the same hour. Gales prevailed at many exposed stations—from S.E. in Norway, but from S.W. or W. in the English Channel, and at Pembroke. The showery weather continued to the close of the week; but fine, bright intervals were enjoyed. In Dublin the mean height of the barometer was 29·619 inches, the range of pressure being from 30·079 inches at 9 a.m. of Sunday (wind, W.N.W.) to 29·052 inches at 9 a.m. of Friday (wind, W.S.W). The corrected mean temperature was 54·2°. The mean daily dry bulb reading at 9 a.m. and 9 p.m. was 53·1°. On Sunday the thermometer fell to 38·9° in the shade; on Thursday it rose to 63·5°. Rain fell in measurable quantity on six days, the total precipitation being ·278 inch, of which ·060 inch was referred to Thursday. The prevailing winds were westerly (W.N.W. to S.W.). Lunar rainbows were seen at Greystones, Co. Wicklow, on Thursday evening. Thunder and lightning occurred in many parts of Ireland in the course of the same night.

The rainfall in Dublin during the nine months ending September 30th amounted to 15·108 inches on 122 days, compared with 10·968 inches on 112 days during the same period in 1887, 17·992 inches on 131 days in 1888, 19·936 inches on 147 days in 1889, 20·855 inches on 151 days in 1890, 18·020 inches on 135 days in 1891, 19·910 inches on 150 days in 1892, and a twenty-five years' average of 19·734 inches on 142·8 days.

At Knockdolian, Greystones, Co. Wicklow, the rainfall in September, 1893, was ·750 inch distributed over 12 days. Of this quantity ·150 inch fell on the 25th, and ·140 inch on the 6th. At that station the rainfall since January 1, 1893, has been 17·091 inches on 118 days, compared with 23·883 inches on 125 days in the same nine months of 1892.

At Cloneevin, Killiney, Co. Dublin, the rainfall in August, 1893, was 2·39 inches on 20 days (the maximal fall in 24 hours being ·37 inch on the 20th), compared with an eight years' average of 2·845 inches on 15·25 days. In September, 1893, only ·46 inch fell at Cloneevin on 11 days. The maximal fall in 24 hours was ·14 inch on the 6th. On an average of eight years the September rainfall at this station has been 1·767 inches on 12·5 days. Since January 1, 1893, 13·90 inches of rain have fallen at Cloneevin.

SYMPHYSEOTOMY.

THERE is a boom now-a-days in symphyseotomy which would rejoice Sigault if he could revisit the glimpses of the moon. In the *American Practitioner and News* (June, 1893), Dr. T. S. Bullock devotes most of his Report on Obstetrics to the operation. We extract the following passages:—"It has been suggested by Dr. I. Edwin Michael, of Baltimore, that the sphere of symphyseotomy is not limited to pelvic deformities. He says there are cases in which it is more imperatively demanded than in contracted pelves. There are face presentations wherein anterior rotation of the chin does not take place. In such a case, if version were impossible, with a fixed and jammed chin, nothing could be gained by delay, and formerly embryotomy was the only procedure practicable. He, after experimenting with a fœtus and a pelvis with the soft parts attached, is convinced that the operation of symphyseotomy is perfectly feasible, and states that he will attempt to so deliver the first suitable case presenting, and asks that it be given a trial. . . . The outlook for symphyseotomy is certainly encouraging, and it bids fair to win for itself a permanent and honorable position as a life-saver. The danger is that it will be again brought into disrepute by becoming the fashion and being unwisely and unadvisedly performed. It is certainly a safe operation, and when it is brought into competition with the Cæsarean section will doubtless carry the day both with the patient and her family."

PERISCOPE.

A NEW ILLUSTRATED DICTIONARY OF MEDICINE, BIOLOGY, AND COLLATERAL SCIENCES.

Dr. George M. Gould, already well known as the editor of two small Medical Dictionaries, has now nearly ready an unabridged, exhaustive work of the same class, upon which he and a corps of able assistants have been uninterruptedly engaged for several years.

The feature that will attract immediate attention is the large number of fine illustrations that have been included, many of which—as, for instance, the series of over fifty of the bacteria—have been drawn and engraved especially for the work. Every scientific physician will also be glad to have definitions of several thousand commonly used terms in biology, chemistry, &c.

The chief point, however, upon which the editor relies for the success of his book is the unique epitomisation of old and new knowledge. It contains a far larger number of words than any other one-volume medical lexicon. It is a new book, not a revision of the older volume. The pronunciation, etymology, definition, illustration, and logical groupings of each word are given. There has never been such a gathering of new words from the living literature of the day. It is especially rich in tabular matter, a method of presentation that focuses, as it were, a whole subject so as to be understood at a glance.

The latest modes of spelling certain terms, as adopted by various scientific bodies and authorities, have all been included, as well as those words classed as obsolete by some editors, but still used largely in the literature of to-day, and the omission of which in any work aiming to be complete would make it unreliable as an exhaustive work of reference.

The publishers announce that, notwithstanding the large outlay necessary to its production on such an elaborate scale, the price will be no higher than that of the usual medical text-book.

SNORING.

In the San Francisco *Pacific Medical Journal* Dr. Remondino publishes an interesting and amusing paper on "How shall we Sleep?" from which the following is an extract:—"We would advise our readers to read Catlin's little work entitled 'Shut your Mouth,' wherein he discusses the bad effect of sleeping with a widely-gaping mouth, and wherein he gives his observations among Indian tribes as to how this evil habit is there unknown, as it is only engendered by the faulty resting of the head during sleep. An Indian always uses a hard material for a pillow, which he places only under the head but not under the shoulders; this throws

his head forwards on to the chest, which closes his mouth and forcibly prevents all snoring—something which would never do for a well governed and discreet Indian, especially when other Indians are about on the look-out for stray scalps. Mouth breathers, according to Catlin, have bad teeth, and with time bring about a stupid cast of countenance; a gaping mouthed stoic is a physical impossibility. Mothers should bear this in mind. All great men have had closed mouths—see that your child sleeps with only its head on its pillow, otherwise it will never become president of the United States, as these have invariably slept like Sitting Bulls or Osceolas and with their mouths shut. We are, as a race, the great snorers of creation—we are not speaking of ourselves particularly but collectively, and in general of the European family—a result greatly due to our bad posturing during sleep. We throw our heads too far back altogether for either any useful purpose or comfort—hence our snoring. In the spring of 1865 we were post surgeon to a military prison near the old Hampton Seminary on Chesapeake Roads. One of the guards—belonging to a detachment of the Third Pennsylvania, Heavy Artillery, of which Dr. Bancroft, now of Denver, Col., was surgeon—in going through the prison barracks one warm afternoon, heard an unusual groaning going on, which he could not locate. The groaning sounds were finally fixed as coming from below the flooring at about the centre of the main hall. This was pried up and to our surprise there lay a broadchested bounty jumper, snoring like a porpoise. He had constructed or dug a tunnel from this point to the water's edge on the outside of the stockade, and having seen daylight through a small hole, he had returned to wait for night to effect his escape. Whilst on his back, weary with toil, waiting for night, and not daring to come out, he unconsciously fell asleep and his weeks of work were brought to nothing by his inconsiderate habit of snoring."

MILK AND TYPHOID.

We take the following instructive facts from the August issue of the Sacramento *Occidental Medical Times*:—"In June an epidemic of typhoid fever broke out in Oakland, opposite to San Francisco, on the other side of the bay. All the early cases had taken milk from the same dairyman, who was supplied from a certain ranch. This was immediately inspected. The 80 cows were healthy, but the ranch was very filthy. The owner and an employé had been ill with typhoid fever for several weeks in different houses. The evacuations had been thrown carelessly on the ground. Water to wash cans and to adulterate milk was taken, usually, from a small creek which ran near these houses, and occasionally from a well on the hill side below the yard. The water from the creek was piped into a tank near the well." On analysis the well-water was pronounced fit for use; that in the tank contained ten times as much

organic contamination as a first-class water and bacteria in great numbers. In 391 cases reported 288 patients had taken milk from the infected ranch. 31 deaths occurred.

THE MACKAY CASE.

It will be remembered that some months ago Mr. John Mackay, the Californian multimillionaire, was severely wounded in the back by a pistol bullet fired at short range by a crank, who immediately attempted to end his own life. Dr. J. W. Keeney and Dr. J. F. Morse, of San Francisco, were in attendance, the latter in consultation. Upon Mr. Mackay's recovery, bills were duly rendered, Dr. Keeney's being 7,500 dols., and that of Dr. Morse 5,000 dols. Mr. Mackay regarded the amounts as excessive, and declined to pay. Suits were commenced, but a compromise was subsequently effected, the bills being reduced to 5,000 dols. and 3,000 dols. There has been a good deal of comment on this case in the lay press, and medical journals have noticed it without much knowledge of the circumstances governing the case. It appears that Dr. Keeney, who saw Mr. Mackay within a few minutes of the shooting, attended him for one month and eleven days. During this period a great deal of time was devoted to the case, the medical attendant frequently remaining all night. The wound progressed favourably, but an intercurrent complication of appendicitis caused much trouble, at one time becoming so serious as to imply a radical operation which, we understand, was actually contemplated. We have no sympathy whatever with the idea that because a man is wealthy he should be the victim of extortion. But when a man of great wealth is in imminent danger of his life, under circumstances that require the greatest possible care and the closest attention, it certainly seems reasonable that he should contribute a proportionately slight pecuniary acknowledgment of gratitude for his recovery. A few additional years of life can hardly be estimated in dollars, nor, perhaps, can the climate of California be lightly exchanged for any other. The regrettable feature in the whole matter was the compromise. This tax on professional good nature is becoming too common, and if charges in proportion to the services rendered and the responsibilities involved were more frequently made, we would hear less complaint of excessive fees. In this connection it is exceedingly interesting to note that Mr. Mackay, as one of the executors of the will of the late Mrs. Fair, was allowed 26,000 dollars, though the services were probably merely clerical. Judge Mesick, in the same case, as attorney for the estate, received 20,000 dols. for the responsibility and about fifteen minutes in Court. We do not regard these fees as excessive, and have no doubt that they were cheerfully paid by the heirs. The contrast, however, between 12,000 dols. and 46,000 dols. is very suggestive, especially when it is remembered that the former sum was scaled down

to 8,000 dols. Assuming, therefore, a parity in skill between financier and attorney, and physician and surgeon, and that an equal amount of labour was performed in each case, we find that the value of Mr. Mackay's life is to Mrs. Fair's estate as 4:23; on which showing comment is needless.—*Occidental Medical Times.*

INOCULATION OF ERYSIPELAS FOR CANCER AND SARCOMA.

The *Medical Record* summarises a paper on this subject contributed to the *American Journal of Medical Sciences* by Dr. William B. Coley. This surgeon had 10 cases of his own and collected 28 others. In 23 of these the erysipelas was accidental, in 15 inoculated; 17 were cases of carcinoma, 17 of sarcoma, 4 doubtful. Of the first, 3 were permanently cured, and one—probably carcinomatous—was well five years after; 10 improved temporarily. One patient died of the erysipelas on the fourth day; 7 of the 17 sarcomatous cases were well from one to seven years after the erysipelas. Two deaths occurred in 44 inoculations. Dr. Coley's conclusions are as follows:—1. The curative effect of erysipelas upon malignant tumours is an established fact. 2. The action upon sarcoma is more powerful than upon carcinoma in about the ratio of 3 to 1. 3. The treatment of inoperable malignant tumours by repeated inoculations of erysipelas is both practicable and not attended with great risk. 4. The curative action is systemic, and probably due chiefly to the toxic products of the streptococcus, which products may be isolated and used without producing erysipelas. 5. This method should not be employed indiscriminately until further experiments have proved its limitations.

NEW PREPARATIONS AND SCIENTIFIC INVENTIONS.

Ophthalmic Atlas.

Mr. Frank Haydon has designed a series of plates for recording pathological conditions of the fundus by means of superimposed layers of colour—viz., orange red, black and enamel white. By the aid of any ordinary pocket knife (not too sharp) each layer may be exposed separately. It is found preferable to hold the knife like an ordinary penholder, and to *scrape* (not scratch) with the blade held at a slight angle, the point being used only for minute details. The layers are intended to be of sufficient thickness to allow of any alteration (such, for instance, as diminishing the size of a vessel, or even its entire obliteration) without exposing the layer immediately beneath. The plates are produced in two forms—No. 1, without the vessels; No. 2, with vessels inserted, in books of 25 and 50, with perforated and gummed edges, at a very moderate price, by Down Bros., 5 St. Thomas's-street, London, S.E. It

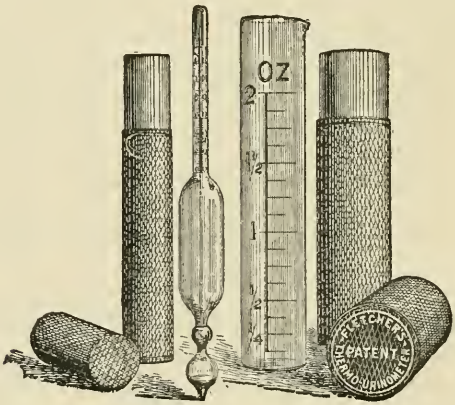
is hoped that these plates will prove of service in recording pathological conditions with the least possible trouble for clinical and statistical purposes.

Diagrams for Recording Ophthalmoscopic Observations.

Messrs. Danielsson & Co. have published very useful diagrams of various kinds to facilitate the recording of eye cases. They are in four pairs (right and left), and consist of—1, cornea; 2, cornea and eyelids; 3, fundus oculi (small); 4, fundus oculi (large); they are only in outline, uncoloured, and gummed at back. We have no doubt but that they will be found most useful to anyone anxious to take accurate notes of his eye cases with the least possible labour. They can be obtained at 52 Beaumont-street, Portland-place, London, W., at a very moderate charge.

Fletcher's Thermo-Urinometer.

This is an adaptation of Fletcher's Patent Thermo-Hydrometer for use as a Urinometer. A most delicate and sensitive thermometer is blown in one piece with the urinometer, so that the physician, when taking the specific gravity of a sample of urine, does not incur the inconvenience



of having to employ a separate thermometer, or of making random allowances for differences in temperature. The Thermo-Urinometer is fitted into a small leather tubular case which packs inside a graduated urine-testing cylinder. The whole is contained in a handsome leather outer case which may be easily carried in the breast pocket.

This very ingenious and useful instrument may be obtained through any surgical instrument dealer, or direct from Messrs. Fletcher, Fletcher & Stevenson, of 21 Mincing-lane, E.C., London. The price, complete, is seven shillings and sixpence.

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(3.) That the presence of Malt Extract facilitates the digestion of additional starchy elements of the Food, which Cod Liver Oil cannot do.

(4.) That the Fats, Carbohydrates, and Proteids are combined in their natural and unchanged states in certain constant proportions, simply by a mechanical process of mixing at an even and low temperature unaided by any drug or chemical of a preservative nature ; and that so combined they remain stable and not liable to decomposition.

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Managing Director.

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The Drink for the Gouty and Rheumatic.

Bullock's Pepsina Porci. DOSE— 2 to 4 grains

Bullock's Acid Glycerine of Pepsine. DOSE— 1 to 2 drms.

In this preparation advantage has been taken of the solubility of Pepsine in Glycerine to produce a convenient and desirable *liquid form* of this valuable medicine; whilst the preservative qualities of the menstruum confer upon the Acid Glycerine of Pepsine the property of keeping for any length of time.

May be prescribed with most substances compatible with Acids.
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The published experiments of G. F. DOWDESWELL, Esq., M.A., Cantab., F.C.S., F.L.S., &c., Dr. PAVY, Professor TUSON, the late Professor GARROD, Dr. ARNOLD LEES, and others, conclusively demonstrate the excellence, high digestive power, and medicinal value of the above preparations.

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Polished Walnut Desk - -	£1 1 0
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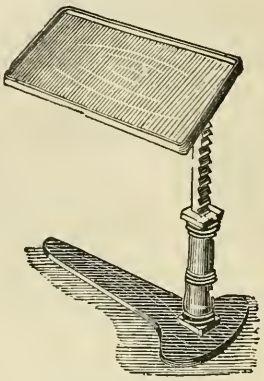

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This can also be used, as shown above, as a Reading or Writing Desk.

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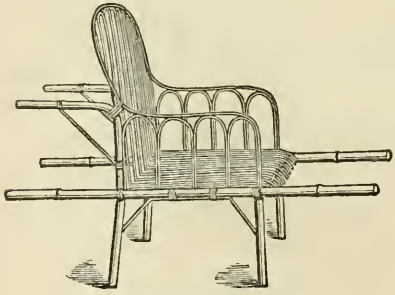

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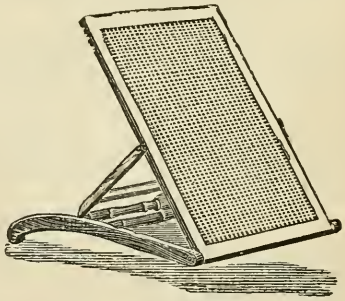

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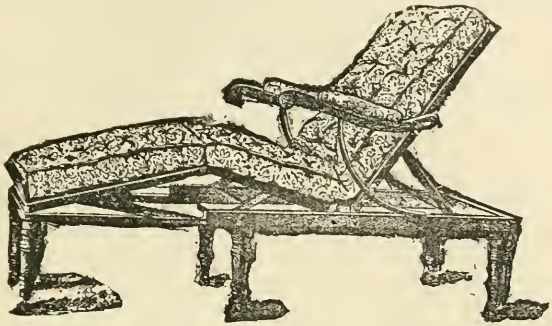

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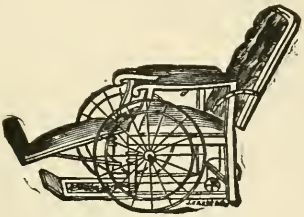

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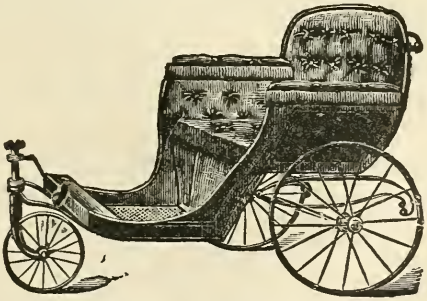

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Is alkaline, and readily soluble in water. In small and frequent doses it is an efficient *diuretic*, but as an *aperient* it should be taken *before breakfast*, in doses of from 1 to 2 teaspoonfuls dissolved in water. To increase the *aperient* action of the Carlsbad Mineral Water, a teaspoonful of the Natural Salt dissolved in water should be added.

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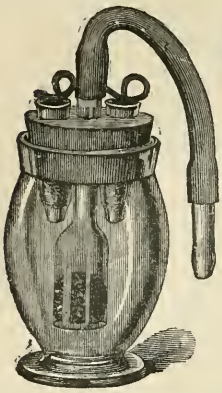

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THROAT AND EAR
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HAY ASTHMA.

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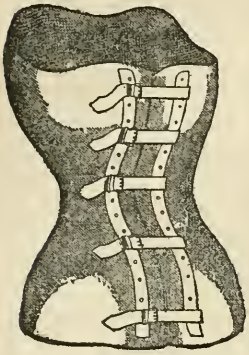


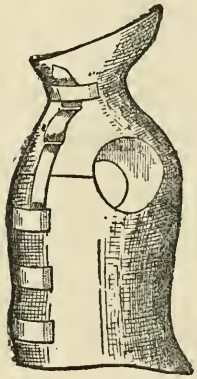
Instructions for Measurement, &c.

JACKET (*in cases of slight deformity*).

Circumference at axilla.
„ waist.
„ hips.
Length from axilla to great trochanter.

In severe angular cases circumference over apex of curve, position of same, and contour should be given; in lateral cases a description of the case.

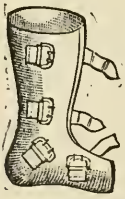
In all cases it should be stated if for male or female.



CERVICAL JACKET.

Same measurements required, and circumference at neck, and length from neck to axilla.

Any part of the Jacket can in the process of Manufacture be left Soft.



CLUB FOOT.

Circumference below knee.
„ ankle.
„ heel and instep.
Length from below knee to ground.
„ of foot.

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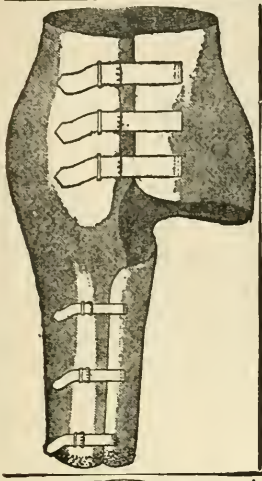

Instructions for Measurement, &c.

HIP SPLINT.

Circumference at waist.
" hips.
" thigh, top of
" above knee.
Length from waist to groin.

State if for right or left side.

LEG SPLINT.

Circumference at top of thigh.
" above knee.
" at knee.
" below knee.
" calf.
" ankle.
Length from groin to centre of knee.
" centre of knee to ankle.

State if for right or left leg.

When the foot-part is required, also circumference of heel and instep, and length from centre of knee to ground.

If the limb is contracted the contour should be given.

Splints are also made in Poroplastic for fracture of Inferior Maxilla, Humerus Elbow-Joint, Forearm, Thigh, Knee-Joint, Leg, Shoulder-Joint, Hand, &c.

These Splints can be fitted perfectly to the Patient if softened either by hot water or in a Heater made for the purpose. When mounted with webbing, hot water will do; if with leather, a Heater should be used. The material becomes quite hard again in two or three minutes.

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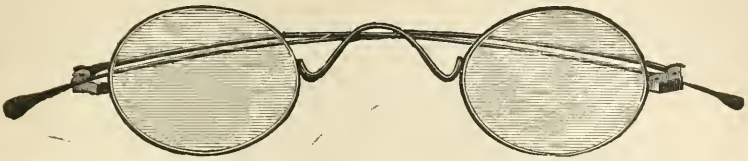

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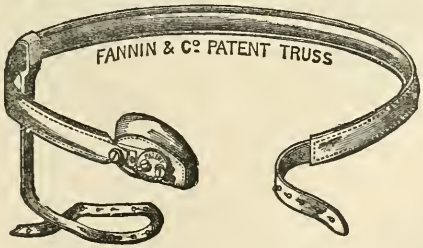

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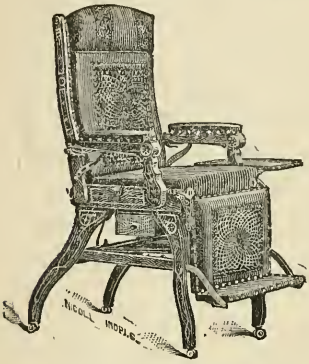
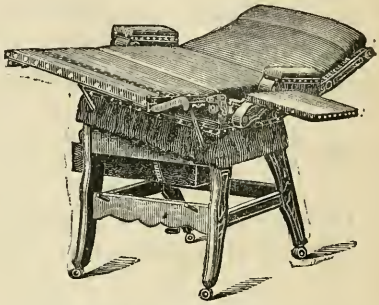
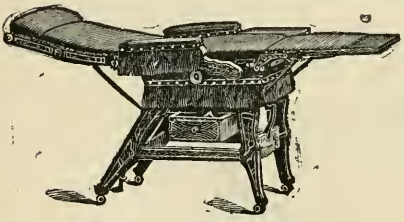


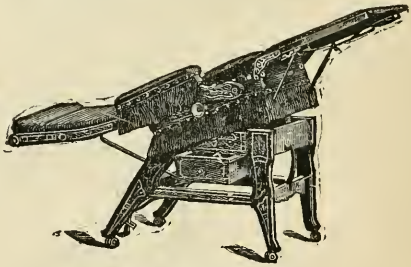
Normal Position.
Can be also used as an Ordinary Office Chair.



Lateral or Sinus Position.
This position is important to gynæcologists, and in treatment of rectal diseases, with side table for instruments.



Horizontal Position



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This position is very important in cases of hæmorrhage or suspended animation, and can be obtained instantly. The patient can be rocked up and down by pressing the lever.

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130 PIL. HYDRARG., gr. i. ,, Rhei Co., gr. iv.	0 8	0 7	0 6
Tonic Pills.			
109 PIL. FERRI (BLAUD), gr. iv. & v. An improved form of unequalled excellence.	0 6½	0 5½	0 4½
212 QUININ: VALER. Zinci Valer Ferri Valer, aa. gr. i.	1 7	1 6	1 5
Aperient Pills.			
45 EXT. ALOES AQUOSUM, gr. xx. Pulv. Cambogiæ. gr. iv. ,, Jalapæ, gr. viij ,, Colocynth gr. vj. ,, Hyd. Subchlor., gr. iv. ,, Sapo. Hyspan., gr. iv. Gingerin. gr. ij. Ft. Pil. xij. *Each Pill contains Calomel, ⅓ gr.*	0 9	0 8	0 7
46 As 45, with 1 gr. Calomel -	0 9	0 8	0 7
47 As 45, sine Calomel - -	0 9	0 8	0 7
533 ALOES BARB., gr. iss. Jalapæ, gr. i. Coloc., gr. i. Cambogiæ, gr. ½ Saponis, gr. ss. Ol. Carui, gtt. ½	0 7	0 6	0 5
Do. c. Calomel, gr. ½ - - ,, gr. I - -	0 7	0 6	0 5
361 PIL. APER. (HOSPITAL), ℞ Ext. Aloes Aq., gr. ij. Pulv. Cambog., gr. ss. ,, Jalap, gr. i. ,, Colocynth. Calomel Pulv. Saponis, aa. gr. ss. Ol. M. Pip., ♏ 1-16th ,, Caryoph., ♏ 1-8th	0 9	0 8	0 7
Quinæ Sulph., B.P.			
203 gr. ¼ - - - - -	0 6½	0 5½	0 4½
204 gr. i. - - - - -	0 7½	0 6½	0 5½
205 gr. ij. - - - - -	0 11	0 10	0 9
206 gr. iij. - - - - -	1 3	1 2	1 1

	Price per Gross: Under 5 Gross	5 Gross	10 Gross
	s. d.	s. d.	s. d.
Cascara Sagrada Ext.			
70 EXT. CASCARA SAGRADA, gr. ij.	0 8	0 7	0 6
434 EXT. CASCARA SAGRADA, gr. iij.	0 11	0 10	0 9
Ergotin.			
98 ERGOTIN, Ferri Sulph. Exsic. Ext. Hellebor. ,, Aloes Soc., aa. gr. i. Ol. Sabinæ, gtt. ss.	1 2	1 1	1 0
Opium, Pulv.			
981 PULV. OPII, gr. ¼ - -	0 7	0 8	0 6
162 PULV. OPII, gr. ss. - -	0 10	0 9	0 8
163 PULV. OPII, gr. i. - -	0 11	0 10	0 9
988 PULV. OPII, gr. ij. - -	1 2	1 1	1 0
Rhei Pil.			
1198 PIL. RHEI CO. (P. L.), gr. iv.	0 7½	0 6½	0 5½
1199 PIL. RHEI CO. (P. L.), gr. v.	0 7½	0 6½	0 5½
Rhei Pulv.			
217 PULV. RHEI. Potass. Sulph., aa. gr. iss. Pulv. Sapo. Hysp., gr. ss. Ol. Ricini., ♏ gr. ss. ,, Croton., ♏ gr. 1-16th	0 8	0 7	0 6
THE "LITTLE" PILL.			
"Little" Antibilious.			
400 JALAPIN, gr. 1-16th Aloir, gr. 1-8th Leptandrin, gr. 1-16th Podophyllin, gr. 1-8th Pulv. Cambog., gr. 1-32nd Ext. Hyoscy., gr. 1-8th Capsicine, gr. 1-64th	0 7	0 6	0 5
"Little" Aperient.			
68 ALOIN, gr. 1-10th Podophyllin, gr. 1-5th Ext. Hyoscy., gr. 1-20th Jalapin, gr. 1-10th Ext. Nuc. Vom. Capsicine, aa. gr. 1-20th	0 7	0 6	0 5
"Little" Cough.			
412 MORPH. HYDROCHLOR., gr. 1-36th Pulv. Scillæ Pulv. Ipecac., aa. gr. 1-12th Bals. Tolu, gr. 1-4th	0 7	0 6	0 5
"Little" Liver.			
410 PODOPHYLLIN, gr. 1-4th Ext. Cascara, gr. 3-4ths Capsicine, gr. 1-20th	0 7	0 6	0 5
"Little" Cathartic.			
398 HYDRARG. SUBCHLOR. Jalapin, aa. gr. ss. - -	0 10	0 9	0 8

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